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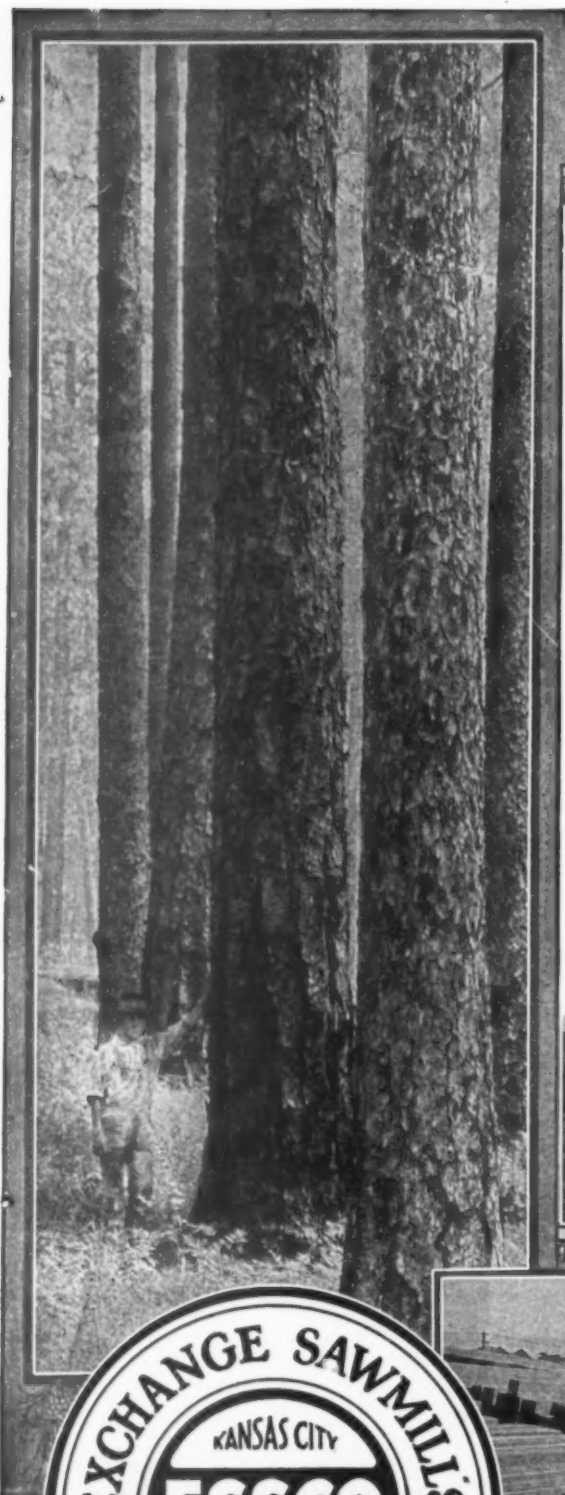
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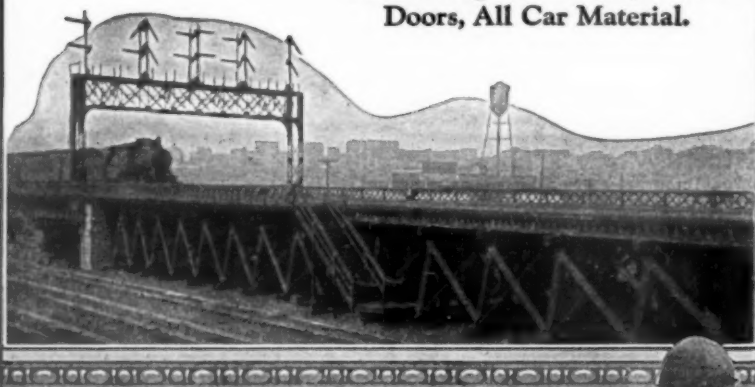
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Railway Retrospect and Prospect

IN the year just closed the railways enjoyed the greatest prosperity since 1917. They have entered the year 1926 with prospects of an increase of prosperity.

The return earned by the Class I roads on property investment in the first ten months of last year was at the annual rate of 4.83 per cent. While this is less than in 1917 when it was 5.02 per cent, or than in 1916, when it was 5.9 per cent, it bespeaks a marked improvement in the financial situation of the carriers since the profound depression of 1921. The return earned in the first ten months of last year on the property investment of the eastern roads was 5.21 per cent, of the southern roads 6.06 per cent, and of the western roads 4.07 per cent. Although the financial results gained by the railways of different territories varied so widely, they were better in each territory than in any year since the adoption of government control.

Prospects of Traffic

The letters from a number of railway executives that are published elsewhere in this issue all express optimism regarding the year 1926. Traffic prospects are excellent. Even passenger business has slightly increased within recent months. This has been particularly true in the southern region, but there have been some gains and no serious losses in other regions since the middle of last year. Total freight business in the last one-third of last year largely exceeded all previous records, loadings having surpassed a million cars a week to the middle of December which is something never known before. Experience has shown that it is hazardous at New Year's to predict traffic during more than the first six months of a year because after that the year's crops become a determining factor. The trend of traffic within recent months makes it pretty safe, however, to predict that during at least the first half of 1926 freight business will be larger than in the first half of any previous year.

Most railway executives say that their properties have capacity to handle a substantially increased business, although L. F. Loree, in an article published elsewhere, sounds a warning that "on our main lines of heavier traffic the margin of capacity to take care of additional business is nearing the danger point." When and where there is surplus capacity it is always possible to handle increased business without corresponding increased costs unless wages and prices of fuel and materials advance. There are no large increases in prices of materials and labor immediately in prospect. The morale of employees is the best in years. The efficiency of operation is at the highest point ever reached and is still increasing and, therefore, an increase of traffic should for some time in future result in a relatively large increase of net earnings.

Reviving Confidence in Securities

While most railway executives believe their properties have surplus capacity, they are planning, as shown by an

article published elsewhere in this issue, to make capital expenditures for improvements and expansion on at least as large a scale this year as within the last three years. There is a large amount of capital in the country seeking investment. This is shown by the easy money conditions and "bull" stock markets of recent months. Reviving confidence in the railways on the part of investors has caused substantial increases in the prices of most railway securities. In December, 1923, this paper reported the average price of twenty representative railway bonds as being \$82.13 and of twenty representative railway stocks as being \$59.55. In December, 1924, we reported these average prices, as, for bonds, \$89.6, and for stocks, \$80.33. The corresponding prices in December, 1925, were, bonds, \$94.91; and stocks, \$98.13. The figures show there has been a marked improvement in the terms on which railways can raise new capital, although they are not yet as good as in prewar years. The valuation decision recently rendered by a federal court in California may well increase confidence in the financial future of the railways.

The service which the railways have been recently and are now rendering is better in almost every respect than ever before. This, together with public relations work which has been done, has created a more favorable public sentiment toward them than has prevailed in a long time.

The western railways are seeking an advance in rates which, if granted, would substantially increase their net operating income. The proposed advance has not met with much opposition from business men except in a comparatively few communities. It has encountered opposition from farm leaders and organizations, but even this opposition has been free from the bitterness toward the railways which has been manifested among western farmers in past years. It is significant that in the discussion of the proposed advance in rates there has been very little of such talk as used to be heard regarding "watered" stock, government guarantees, inefficient management, high official salaries and so on.

Several bills for changing railway regulation have been introduced in the present Congress which, if passed, would do harm. Probably the worst is the Gooding bill which would absolutely prohibit the railways from making lower rates for longer than for shorter hauls to meet water competition. The amount of adverse legislation threatened is, however, less than during any recent session of Congress. It now appears probable that the Howell-Barkley bill will not reappear and that a measure for dealing with railway labor controversies that has the backing of both labor leaders and railway executives will be introduced.

On the whole, the railway situation may reasonably be said to be better than it has been at any time for ten years. The net return being earned is not relatively as large as it was ten years ago, but the attitude of labor

leaders, employees, regulating authorities and the public toward the railways is better than then.

Some Less Favorable Factors

There are, however, factors of the situation which cannot be regarded with entire complacency. Some federal legislation is being urged with strong backing that would be very injurious. A movement for advances in wages is looming on the horizon. Public attention is being more and more called to the fact that the net returns being earned by the railways are increasing and already in some territories are producing the so-called "fair return"; and citation of such facts is being more frequently coupled with the intimation that the time is approaching when general reductions of rates should be made in some territories.

The railways are doing better, and their prospects are

better, than for a long time, but the exertions by which the improvements in the situation have been effected dare not be relaxed. As President Markham of the Illinois Central says in an article published elsewhere in this issue: "When conditions are favorable is the very time to be most diligent in keeping them so. This applies to public relations work with the same force as it applies to all other phases of business conduct. Satisfaction is dangerous if it results in a slackening of efforts. We seldom stand still. We are either making progress or slipping back."

The future of the railways this year and in later years will be mainly determined by their own officers. Their official personnel never displayed more public spirit and ability than within recent years. We believe that when the record for 1926 is written it will show that during this year the railways were not slipping back but were still constantly making progress.

Two Years' Increase in Operating Efficiency

THE increases in the operating efficiency of the railways as a whole which occurred in 1925 were a tribute to the general policies of the managements, to the energy and skill of all classes of officers in the operating department and to the loyalty and morale of the employees.

The chief executives of the railways early in 1923 joined in announcing to the public a program for improving railway service by large capital expenditures and by intensifying the utilization of available facilities. The efforts made resulted in that year in marked improvements in operating efficiency. The business handled in 1923 was larger than in the last previous peak year, 1920, and it was handled much more satisfactorily and with much greater economy than that of 1920. But good as was the record made in 1923 it was greatly improved upon in 1925, when, unlike that of 1924, the traffic again equalled previous high records. The policy of the managements in 1923 and subsequently in making liberal capital expenditures to replace obsolete and worn-out equipment with new and better locomotives and cars and in improving and enlarging other facilities, was fully vindicated in 1925, as in 1924, by the increases in operating efficiency gained and the increases in the net operating income earned.

At the time this editorial is being written no complete operating statistics for any month of 1925 later than September are available. In the early months of last year freight business was not as large as in the early months of 1923, and through no fault of the railways, the average load per loaded car was smaller. These things rendered it difficult to improve operating records, and yet the records of two years ago were completely surpassed. In September the volume of freight business was greater than in any previous thirty-day month, and operating efficiency was at its maximum, although the improvement shown

was not relatively as great as in the entire nine months, this probably being due to the fact that more of the older and less efficient equipment was used.

Operating statistics for the first nine months of 1923 and 1925 and for September are given in the accompanying table. The average number of cars handled per average freight train in the nine-months' period substantially increased. The result was that, in spite of lighter loading per car, both net tons and gross tons per average train increased. In spite of the increase in the average train load, the average speed of trains also increased. In consequence, in the first nine months of 1925 average net ton miles per train hour increased 13.5 per cent over the first nine months of 1923, and average gross ton-miles per train hour increased 16.9 per cent. The increase in average net ton-miles per train hour over the corresponding part of 1920 was 20 per cent and in gross ton-miles per train hour 33 per cent. The consumption of coal per 1,000 gross ton-miles in the first nine months of 1925 was more than 14 per cent less than in the corresponding part of 1923.

The record of operating efficiency made in September, when a peak volume of business was handled, far surpassed all previous records for that month. As a glance at the table shows, all the figures in it reflect increased efficiency as compared with September, 1923, except that for average loading per car. They explain why, with an increase over September, 1923, of only \$20,000,000 in total earnings, the railways made a gain of \$42,400,000, or 46 per cent, in net operating income.

Much emphasis has been placed upon the need of large capital expenditures to increase railway capacity. Very much too little emphasis has been placed upon the need for large capital expenditures to enable the railways to operate more economically and thereby earn larger net operating income for themselves while at the same time preparing

STATISTICS OF OPERATING EFFICIENCY FOR THE FIRST NINE MONTHS OF 1925 AND 1923, AND FOR THE MONTH OF SEPTEMBER 1925 AND 1923.

	First nine months of 1925	First nine months of 1923	Percent Inc. or Dec., 1925 over 1923	Month of September 1925	September 1923	Percent Inc. or Dec., 1925 over 1923
Car Miles Per Car Day	27.6	27.6	....	30.7	29.2	+ 5.1
Net Tons Per Loaded Car.....	27.0	28.1	- 3.5	26.8	27.4	- 2.2
Net Ton-Miles Per Car Day.....	482	513	- 6.0	538	531	+ 1.3
Cars Per Train	43.7	39.6	+10.4	45.3	41.2	+10.0
Gross Tons Per Train	1,666	1,535	+15.0	1,743	1,595	+ 9.3
Net Tons Per Train.....	744	718	+ 3.6	777	733	+ 6.0
Average Miles Per Train Hour.....	11.8	10.8	+ 9.2	11.7	11.1	+ 5.4
Gross Ton-Miles Per Train Hour.....	19,735	16,578	+16.9	20,469	17,705	+15.6
Net Ton-Miles Per Train Hour.....	8,821	7,771	+13.5	9,128	8,165	+11.8
Loco. Miles Per Loco. Day.....	56.6	60.4	- 6.3	62.0	61.1	+ 1.5
Gross Ton-Miles Per Mile of Road Per Day.....	11,329	11,285	+ .4	12,753	11,958	+ 6.6
Net Ton-Miles Per Mile of Road Per Day.....	5,195	5,369	- 3.2	5,856	5,604	+ 4.5
Pounds of Coal Per 1,000 Gross Ton-Miles.....	138	161	-14.3	128	146	-12.3

the way for reductions of the rates paid by the public. In order to operate with maximum economy the railways need to buy more new and improved locomotives and cars and retire obsolescent equipment more rapidly. Thousands of locomotives and cars are being carried on their books as in "good condition" which should be more rapidly replaced because they are incapable, when actually used, of producing the number of ton-miles necessary to make them an asset instead of a liability. Vast improvements are also needed in roadway, passing tracks, signals, terminals and shop and other terminal facilities to make it possible fully and effectively to utilize modern equipment, and especially modern locomotives.

The increases in operating efficiency and economy which

actually have been accomplished as a result of the capital expenditures of the last three years are merely a token of the increases that may be achieved in the future by wise and adequate capital expenditures. Owing almost entirely to operating economies that were made possible largely by the capital expenditures of the last three years the net operating income earned by the Class I roads in September and October, 1925, was \$77,000,000 greater than in the same months of 1923. *This increase in net operating income in these two months alone was sufficient to pay almost 9 per cent per annum upon the entire net increase in the property investment of these roads in the year 1923, when the investment made was the greatest in any year since the war.*

Past and Future of Freight Business

THE railways of the United States, at the end of 1925, completed a period of five years in which there was virtually no increase in their total freight business. Never before did their freight traffic show practically no gain for so long a time. The number of tons carried one mile in 1923 was only about one per cent greater than in 1920. It declined in 1924, and when complete statistics are available will be found to have been just about the same in 1925 as in 1923.

The number of freight cars loaded last year exceeded all previous records. This is one measure of railway service, but the true measure of the amount of revenue business handled is the number of tons carried one mile.

In some ways the failure of freight business to increase within recent years has been a relief and advantage to the railways. For some years before the great slump of traffic in 1921 they were constantly engaged in a struggle to raise capital and enlarge their facilities sufficiently to cope with the increase of traffic, but they were often not able to do this. The failure of traffic to grow much within recent years has given them time and opportunity to raise and invest capital under conditions and in ways which have resulted in making the railroad plant adequate to present and immediately prospective demands in most parts of the country.

This having been done, the important question now naturally arises as to whether the trend of traffic in future years probably will be similar to what it was in the more than twenty years of almost uninterrupted and rapid growth which ended with 1920, or similar to what it has been since 1920. What policy in making capital expenditures should be followed in the future depends on the answer to this question.

Two Widely Different Periods

The difference between what occurred in the railroad field before the war and what has occurred since can perhaps be best illustrated by comparing statistics for two periods of unequal length. The first of these includes the ten years from June 30, 1903 to 1913. This period is chosen because the year ended June 30, 1913, was the last before the war when the railways handled a record breaking freight business that was not affected by the war either in Europe or in this country. The second period used in the comparison is that from June 30, 1913, to the end of 1925, which includes twelve and one-half years.

In the decade ending on June 30, 1913, the number of tons of freight originated increased 467 million tons, or 65 per cent. The number of tons carried one mile increased 128 billion tons, or 74 per cent. The number of passengers carried one mile increased 65 per cent. The mileage operated increased 48,000 miles. There is no satisfactory measure of total railroad capacity. Railway

managers try, however, to maintain an efficient and economical relationship between the capacity of equipment and of permanent structures. There were serious shortages of transportation in the early years of this period, but net earnings were large, capital was readily available and a huge increase in the capacity of the railways was made. The increase in the aggregate tractive power of locomotives was somewhat more than one billion pounds, or 108 per cent. The increase in the capacity of freight cars was about 40 million tons, or 81 per cent. The investment made in property was \$5,600,000,000.

In the twelve and one-half years ended with 1925 the increase in tons originated was about 200 million, or 17 per cent. The increase in the number of tons carried one mile was 114 billion, or 38 per cent. The increase in passenger miles was only 4 per cent. The increase in mileage operated was about 4,500 miles. The increase in tractive power of locomotives was about 790 million pounds, or approximately 40 per cent, and the increase in the aggregate capacity of freight cars was about 19 million tons, or approximately 23 per cent. The increase in property investment was approximately \$6,400,000,000. The average annual increase in property investment in the second period was less than in the first period, and was relatively not much more than one-half as great annually if allowance be made for the differences in the costs of labor and materials in the two periods, and yet because of the relatively small increase in traffic the railways now have some surplus capacity.

The most notable fact about developments during the period since 1913 is that after a decline in 1914 and 1915, freight business rapidly increased until 1920, with the result that railway facilities became seriously inadequate, while since then freight business has hardly increased at all, with the result that the increase between 1913 and 1920 accounts for practically the entire increase in the last twelve years. The ton mileage of 1920 was 37 per cent greater than that of 1913, while the ton mileage of 1925 probably was not one per cent greater than that of 1920. The passenger mileage of 1925 was 25 per cent less than that of 1920.

It is easy enough to attribute the failure of freight business to grow within the last six years to "the aftermath of the war." This, however, merely begs the question. If it is due to the "aftermath of the war," what have been the specific influences put in operation by the "aftermath of the war" that have produced the result?

The decline of passenger business since 1920 is, of course, due to increased use of private automobiles and motor buses. The failure of railway freight business to grow is sometimes attributed to the competition of the motor truck. No doubt this has been one of the causes, but it seems to have been a minor one. The effect of the

competition of the passenger automobile is clearly shown by the increase which has occurred in the average rail journey per passenger. Meantime, in spite of the competition of the motor truck for short haul business, the average rail haul per ton of freight has declined in all the three large territories of the country. The steamships operating via the Panama canal have taken a good deal of long haul business from the railways, and it is significant that the decline in the average haul has been the greatest in western territory where the competition of the canal is most felt. However, changes in the average haul per ton do not seem to have much significance in this connection, since it continued steadily to increase to the end of 1922 in spite of the relatively small freight business of 1921 and 1922.

Traffic Per Capita Has Declined

The failure of freight business to grow since 1920 sometimes has been attributed to failure of the population of the country to grow as formerly. This explanation is fallacious because, in spite of immigration restrictions, population has been growing. Statistics regarding tons carried one mile per inhabitant are significant. In 1903 ton-miles per inhabitant were 2,139; in 1913, 3,085, an increase of 44 per cent in ten years; in 1918, 3,913, another increase of 27 per cent in five and one-half years; in 1920, 3,856; in 1923, 3,778; in 1924, 3,466, and in 1925 approximately 3,624. These figures show that before and during the war the freight business handled by the railways per inhabitant steadily and largely increased, but that in 1918 it reached its maximum, and has since declined. The same thing is true of tons originated per inhabitant.

There are interesting and significant contrasts between the statistics regarding the growth of freight business in the three large territories of the country. The increases in ton mileage in the ten years ending with 1913 were as follows: Eastern district, 77 per cent, Western, 51 per cent, Southern, 132 per cent. The increases since 1913 have been approximately as follows: Eastern district, 19 per cent; Western, 45 per cent; Southern, 89 per cent. In the Eastern district the ton mileage in 1925 was about 4 per cent less than in 1920; in the Western district about 3 per cent less; in the Southern district, about 18 per cent greater. The only reason why total freight business last year was not actually less than in 1920 was that the increase in the south offset decreases in both east and west.

Why Has Traffic Not Grown?

Undoubtedly one important factor affecting the growth of traffic since 1920 has been the large reduction of inventories which has been occurring throughout industry and commerce, and which has been made possible by improved railway freight service. The manufacturer who has reduced his inventory has bought and had shipped to him less raw materials and fuel than would have been the case if he had not reduced his inventory. Likewise, the wholesale or retail merchant who has reduced his inventory has had less goods shipped to him than would have been the case if he had bought enough to replace all that he sold. There is, however, of course, a limit below which inventories cannot be reduced. After that limit has been reached the freight shipped to manufacturers and merchants must at least balance the sales made by them. The effects that these reductions of inventories and the policy of hand-to-mouth buying that recently has prevailed have had upon railway operation are easily discernible. They have contributed to causing the reduction in the average load per car which has made it necessary for the railways to increase car loadings and freight car miles while there has occurred no increase in ton-miles.

Probably the most important reason why freight business so long has failed to increase has been that since 1920

the increase in the plant of the country's industry has been relatively less than it was before. Part of the freight carried consists of commodities purchased for more or less immediate consumption. Part of it consists of commodities for use in enlarging the manufacturing plants, mines, etc., with which production is carried on. All the data available indicate that this second kind of traffic has declined. For example, in the ten years ending with 1914 the average annual increase in the horse power of the manufacturing industry was 895,000 hp. In the five years 1914 to 1919 the average annual increase was 1,413,000. In the four years ending with 1923 it was 897,000. The increase in the capacity of many manufacturing industries during the war years was so great that they have had surplus capacity ever since. There has been, within recent years, a large amount of building construction in the cities. On the other hand, those who are in the best position to know say that for some years, and until recently, building construction on farms has been abnormally small. It is also well known that until comparatively recently the agricultural implement industry was depressed because of the small purchases of implements made by the farmers.

It is not susceptible of complete statistical proof, but the available evidence indicates that for some years rebuilding and expansion of the plants of most important industries, including agriculture, have been relatively much less than before and during the war. Since population has continued to grow, and since labor generally has not suffered from serious unemployment, the question may be raised as to how, if there has been no normal expansion of the country's industries, labor recently has been kept employed. Probably the answer is to be found in the fact that during the war there were reductions of hours of work in most industries, resulting in a reduction in the average output per man which made it necessary to employ more men to get the same output. Only recently have the railways, in spite of large capital expenditures, begun to get as much output per employe as nine years ago.

What of the Future?

The inferences suggested by what has been said are obvious. It is no more probable that expansion of the country's entire productive plant will not some time be resumed on a large scale than it is that inventories will continue to be reduced. There is at present a vast amount of capital in the country seeking investment, as has been shown by the "bull" stock market and the "boom" in the southeast. Most of this capital is sure, sooner or later, to find investment in the nation's plant for the production of commodities of all kinds. There is, therefore, nothing in past experience or present conditions to indicate that the railways will not soon begin again to handle an increased business per capita. Freight business per capita increased almost continuously during the quarter century ending with 1920. It is now and has been, even since the war, increasing rapidly in the south.

Some predictions that there would be a large increase in total freight business within a short time have been proved by developments to have been ill-founded. Within recent months, however, total ton-miles have exceeded all previous records and prospects of traffic for the months immediately ahead are bright. While railroad freight business may not in future increase at as great a rate as was normal before the war, it seems reasonable to anticipate that the period during which there has been no substantial growth of freight business is nearing its end or is actually ended, and that the time is near when expansion and improvement of the railroad plant in most parts of the country will be needed, not merely to handle better a total traffic that is not growing, as has been the case during the last six years, but to handle a largely increasing business.

Prospects of Business Are Excellent

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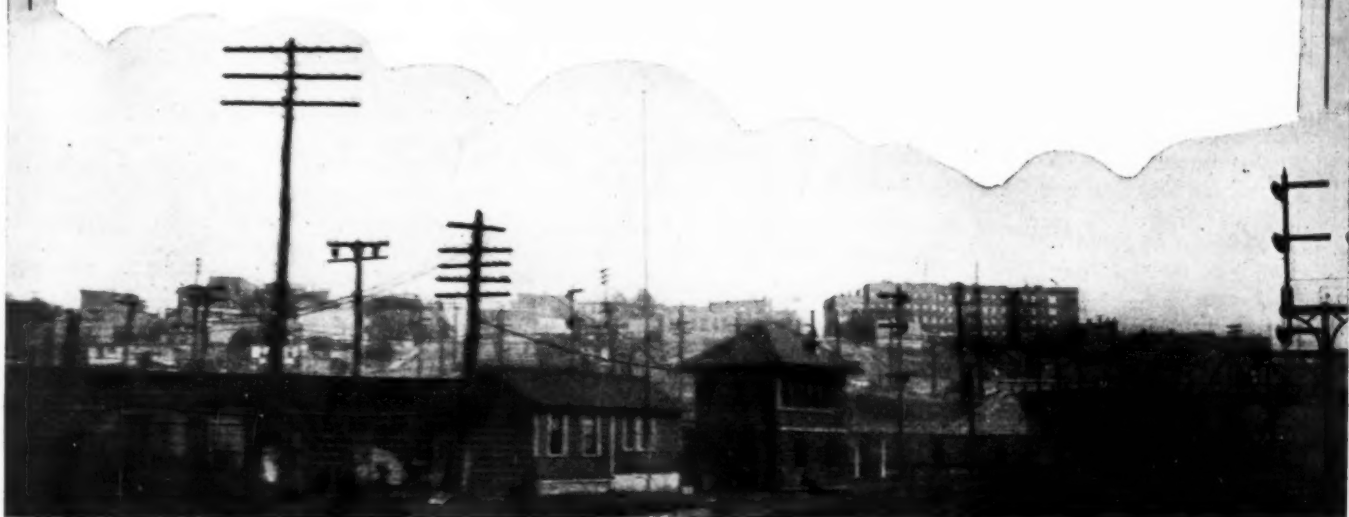
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Prospects of Business Are Excellent

*Outlook for traffic, capacity of carriers, probable capital expenditures and legislation discussed
by railway executives*

IT is gratifying to the *Railway Age* that it is able in the following pages to present a very interesting symposium of the views of railway executives and regulating authorities regarding subjects that are of especial interest at the present time.

In response to requests made by this paper R. H. Aish-ton, president of the American Railway Association and chairman of the Association of Railway Executives has discussed the subject "How Good Service can be Maintained." E. W. Beatty, president of the Canadian Pacific Railway, has written on the railway situation in Canada. C. H. Markham, president of the Illinois Central, has expressed his views as to what the railways should do to maintain and improve the present unusually favorably public sentiment toward them. Commissioner Ernest I. Lewis of the Interstate Commerce Commission has discussed the relations between the railways, their patrons and the regulating commissions.

Responses made by a number of railway executives to a questionnaire regarding traffic prospects in 1926, the present capacity of the railways, capital expenditures that

probably will be made and what railway legislation, if any should be passed, also are published herewith.

The questionnaire in reply to which the articles in question were written was as follows:

1. How do you regard prospects for railway traffic, both passenger and freight, in your territory, for 1926?
2. Having in mind the trends of railway traffic both before and since the war, what is your opinion as to the extent to which in the near future it will be necessary for the capacity of railways in your particular territory to be increased to enable them to render as good service as generally has been rendered during the last three years?
3. Will the increased capacity need to be provided by relatively greater expenditures for (a) increased and improved equipment or (b) other additions and improvements?
4. What changes, if any, in present federal laws regulating the railways, and in their administration, do you favor?

Better Understanding Helps Railways and the Public

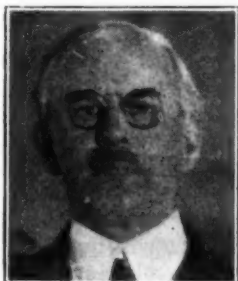
By Ernest I. Lewis
Interstate Commerce Commissioner

WE are not ready yet to salute the dawn of the millennium, but there is easily discernible a development of, a real advancement in, better relations between the great service corporations and the public which they serve. I do not distinguish between "public utilities" and "carriers."

Progress seems to have grown in proportion to the realization on the part of public service companies of their duties as well as their rights and, on the part of the public and the authorities, to the broadening of understanding of problems incident to public service.

This era of better understanding has brought a realization, too, that regulation can be carried to extremes, and regulatory commissions generally are rather more inclined to draw the line sharply against encroachment on actual management. We begin to discern indications that the commissions have been performing a high educational service in inculcating principles and teaching methods.

No better demonstration of the possibilities of, and the advantages to be derived from, understanding between the railways and their patrons is needed than that afforded by the practical cooperation adopted for dealing with the problem of car supply. Carriers and shippers now meet voluntarily in regional conferences, affording personal contact of those who serve and those who are served.



They jointly analyze and forecast transportation demands. Many beneficent results are being realized. The carriers have been encouraged to equip themselves to meet the national and local demands for service. The shippers are gaining a better appreciation of the problems of the railroads. They are having brought home to them as never before the realization of what good service means. They are realizing that it is essential that we have hardy, well-equipped transportation companies if we are to be a healthy, prosperous, vigorous nation. Shippers and carriers are voluntarily beginning to withdraw from commissions one of the most troublesome of common carrier problems. With possibly the exception of Florida, where extraordinary conditions now prevail, it is probable that all commissions have received less complaints during the past year than at any time in the past.

There has thus been brought into the field of private operation and control a public participation in the management that has thus far produced impressively practical results. Possibly an even greater result has been attained in the establishment of closer personal contacts and the better mutual understanding between those responsible for rendering, and those dependent on, the transportation service. This it may be hoped, will open the door of opportunity for consideration of other problems and their settlement amicably and voluntarily "out of court."

Freight rates and charges are one of the most important sources of misunderstanding and bad feeling. Does not the experience with the shippers' regional advisory boards in the field of car service suggest the opportunities for promoting good relations between the carriers and

the public in the controversial field of freight rates?

Voluntary acts that are the result of mutual understanding and consideration are superior in quality and likely to be more lasting than imposed duties. I have advanced the thought that the best form of government is that which is called upon to exercise its powers least but which imparts ideals and creates conditions for that understanding which leads to voluntary action.

The only worth while public relations work is that which establishes character and a reputation for good service, good will, fair dealing, courtesy, sincerity and broad public concern. Personal contact is a great factor. Public service corporations which are most successful seem to be those whose directing heads are known to be approachable, who have and who exercise a broad interest in affairs, and who permeate their organizations with their anti-quibbling spirit.

As applied to regulatory bodies the term "public relations" involves the performance of our duties in such a way as to merit public esteem, impart assurance and maintain and increase confidence. More than team work and the elimination of evidences of personal differences and differences in thought are necessary. There is much criticism of delay in decision and results. There must be established a record of achievement, reputation for sincerity of purpose, clear thinking, thoroughness, aloofness from influences, and strict impartiality.

Regulatory bodies and public service corporations can do much to clarify the situation by fully informing the public mind as to the law; and as to the status, character,

and duties of regulatory bodies and public service corporations. Let these facts be reduced to simple terms, popularly defined, and disseminated widely. There continues misconception, misunderstanding, and, in many instances, misrepresentation of the law. Such misinformation is as persistent as the idea that carriers are guaranteed six per cent return. A considerable element of the public mind likewise continues to conjure up injustices of rates based on capitalization. We who know the facts can not conceive of such a misinformed and misguided state of public mind, but the fact that it is extensive must be faced.

Commissions need friends. The laws which they administer need correct interpretations and application and, if needs be, protection from misrepresentation and distortion. A number of commissions on occasion have told the people what they had done, how they do it, what their duties and responsibilities are, and what the law is; and they prevailed over sinister attack.

As the principal agency of public information is the press, it follows that it is especially important that representatives of the press be informed adequately so that they may be enabled to interpret what is done with the light of understanding. Most of us who have come in contact to any considerable extent with the members of the fourth estate have learned that our confidence is not misplaced, and that frankness and truthfulness are productive of good results. Even those who may be critics will distinguish between a frank and a dissembling attitude, and nothing provokes their criticisms so readily as a suspicion of the latter.

Railway Situation in Canada

By E. W. Beatty

President, Canadian Pacific System

THE railway situation in Canada has not changed materially in the past four years, though improvements in some respects have been indicated as a result of the operations for the year just closing. It is a very unique situation and does not lend itself to the ordinary tests applied to railway operations in the United States. There is, however, this to be said of it, that it has developed no surprises and the results of the operations of all companies strongly reflect the lack of industrial activity from which the country itself has suffered recently. This has been in a measure offset in the past year by very substantial crops, an increase in international business and new traffic created by the development of districts just opening up.



The past two years, while not causing any anxiety, have called for careful expenditures and economical operation. In consequence of these general conditions, few works of great magnitude have been undertaken though, so far as the Canadian Pacific is concerned, its expenditures on capital account for new works and branch lines have been steady if not spectacular, and betterments and improvements have been continued practically on the usual scale.

The prospects for 1926 are substantially better than those for 1925 were at the end of last year. The principal factors in this more hopeful outlook are the large crops throughout the whole of the country, a great deal of which will require to be moved during the spring

months, and the generally more healthy tone of business due to the putting into circulation of new money in consequence of greater agricultural production and good prices. It may be confidently expected that the eastern portion of Canada will feel the stimulus of the increased buying-power in the west and of the agricultural districts generally, and that there will be a resultant increase in traffic.

Canada is notoriously over-built in respect of railways due to over-optimism in pre-war years and faulty government policies. It will be a long time before its railway facilities will require to be extended save by a moderate amount of branch line construction into newly developed districts. This, of course, does not mean that ordinary betterments will not be continued or that rolling stock will not be increased as necessity requires but only that substantial additions to existing mileage will not be necessary until production in the country has reached greater volume and manufacturing industries are working to capacity.

This country fortunately possesses a very comprehensive piece of railway-regulating legislation in the form of the Canadian Railway Act, first passed in 1903 and having been revised as late as 1919. It confers upon the Dominion Railway Commission powers very similar to those enjoyed by the Interstate Commerce Commission, save that they have no jurisdiction in respect of railway financing—a jurisdiction which is not, in the present circumstances, necessary as over half the mileage of Canada is government-owned and the financing of the National System is taken care of by the creation of direct or indirect obligations of the country. As in other countries,

however, where government ownership exists, political interference is not unknown and the danger of such interference with a government-created tribunal is intensified by the possession by the government of a huge railway system of its own. Nothing could be more damaging than that this interference should ever affect the deliberations of a judicial body such as the Dominion Railway Commission, and I think this view is held by the business communities of Canada from one end of it to the other. Any serious interference with the integrity of the commission would be strongly resented and would probably result in legislation designed to preserve it under heavy penalties.

The Canadian Pacific Railway Company, the only large private railway enterprise in the country, has made substantial progress and will continue to add to its facilities.

both rail, steamship and hotels, during 1926 and succeeding years.

The results of the operations for the year 1925 will be entirely satisfactory, but, like other companies, results in subsequent years will be strongly influenced by the extent of the industrial and agricultural prosperity of the Dominion.

I am one of those who believe firmly that Canada has turned the corner and new faces considerably greater prosperity than it has enjoyed in recent years, a prosperity, I might say, which will be greatly accelerated once a more definite decision has been made which will permit one or other of our political parties to form a government strong enough in Parliament and administratively to give the country those constructive policies upon which the prosperity of business so much depends.

Public Should Be Told Railroad Achievements

By C. H. Markham

President, Illinois Central System

THE year-end is traditionally a season of optimism. The old year may have witnessed the defeat of some of our most cherished plans, along with the success of others, but a new year lies before us unexplored. It is well that at this transition time we should face the obligations and opportunities of the new year fortified with the spirit of optimism.

Concerning the railway situation at this year-end we are particularly justified in feeling optimistic. The railroads in 1925 did not accomplish all that was hoped for, but that they made substantial progress no one will deny. They met the exacting requirements of the country for transportation in a capable manner and to the general satisfaction of their patrons. In the face of a low rate level—exceedingly low when compared with the general price level—they accomplished a more satisfactory net operating income than in any other year since the economic upheaval resulting from the late war. The railroads of the western territory, because of many unfavorable conditions, one of which was the inadequate level of their rates, lagged in this phase of progress. Their unsatisfactory showing constitutes one striking exception to the generally satisfactory results of 1925. The railroads as a whole continued to improve and extend their facilities, with the result that railway facilities today are in better condition and better fitted to the needs of the country than at any other time in recent years.

Progress also marked the cultivation of the railroads' public relations in 1925. This progress for the most part consisted of a continuation of the progress made during the several years immediately preceding. There was no major political conflict bearing upon the railroads to test public opinion in railway matters in the year 1925, but by the trend of editorial comment in the public press and the attitude expressed by men in public life, both of which reflect public opinion, it is increasingly evident that the railroads have grown and are continuing to grow in the public favor.

When conditions are favorable is the very time to be



most diligent in keeping them so. This applies to public relations with the same force as it applies to all other phases of business conduct. Satisfaction is dangerous if it results in a slackening of effort. We seldom stand still. We are either making progress or slipping back.

It will be a grievous mistake if the railroads slacken in their efforts to win public support. In the cultivation of public relations we should guard against falling into the error of the man who could not repair his leaky roof in the rain and who said it did not need repairing when it wasn't raining. When the railroads are going along smoothly, giving excellent service and making diligent preparations to meet the increased needs of the future, as they are now, it may seem to be a time when they have less need of what can be accomplished by public relations work, but it is the very time that public relations work can be carried on most effectively.

The railroads now have a story of wonderful progress and achievement to tell, and they ought to tell it. They have passed through a very trying stage of their history. After suffering the ravages of war, they faced, five years ago, the extremely difficult task of meeting unprecedented transportation requirements. With forward-looking legislative enactment, with the support and confidence of influential groups and with the exertion of their utmost efforts they weathered the storm. They put their properties in shape to handle satisfactorily the business offered them. For three years now they have functioned with commendable economy and efficiency, accepting rate reductions and tax increases, and at the same time largely restoring their credit from the shattered wreck of war-time.

The recent revival of our railroads is a story of accomplishment in the public service which excels in romantic appeal any story of the railroads ever told either in fact or fiction. And the railroads ought to tell it on every suitable occasion.

Public relations activities come under two general classifications, one defensive, the other offensive. Defensive activities consist of meeting and answering attacks and explaining unsatisfactory conditions. The need of such activities has diminished with the improvement in the general railway situation. That allows more opportunity for telling the good things that now ought to be told about the railroads. The latter seems to me to offer the greater possibilities of constructive achievement.

How Good Service Can Be Maintained

By R. H. Aishton

President, American Railway Association and Chairman, Association of Railway Executives

THE railroads of the country, during the past few years, have more than kept pace with industrial development, as evidenced by the fact that during 1925 they handled without difficulty the greatest freight traffic on record while at the same time they continuously showed a surplus of serviceable freight cars and locomotives.

Their ability to meet the transportation demands made upon them in 1925 was largely due to enormous capital expenditures made during the past four years for improvements to their equipment and plant facilities. It also was due in part to a better understanding of transportation problems on the part of the shippers and their cooperation through the various Shippers' Regional Advisory Boards organized throughout the country. The cooperative effort and loyal support of railroad employees in carrying out the policies of the managers also was a contributing factor.

The record freight traffic handled in 1925 was moved with the greatest efficiency and economy on record while the dependability of transportation service to the public



and the speed with which it was handled has never before been equaled. The ability of the railroads, as demonstrated during the past year, to carry the farmers' produce or the commodities of any other shipper to market in three days instead of five or in six days instead of nine, has been of inestimable benefit, not only to the farmer but to the general public. Such service, in effect, brings the farm or the producing point for various commodities much nearer to the market, to the mutual advantage of the producer, the shipper and the purchaser.

An era of better mutual understanding of business problems by the railroads and of railway problems by business has been firmly established, and should have an increasingly wholesome effect on railroad performance, not only during the coming year but also in the more remote future.

The carriers need to be placed and to be maintained on a sound economic basis. They should be permitted to earn a fair return on their property value, which they have not yet done, even with the improvement in net income in 1925. Their credit needs to be fully restored so that they can secure money by the issuance of stock rather than by further increasing fixed charges by issuance of bonds. If these requirements can be met, the railroads can continue to give the splendid service which the public needs and which it demands.

Panama Canal and Motor Competition Felt

By J. S. Pyeatt

President, Denver & Rio Grande Western

I TAKE pleasure in commenting upon conditions covered by your inquiries in the territory served by our lines—Colorado, Utah, New Mexico—because of the rather favorable present and prospective aspect of those conditions.

1. General business conditions the country over are, as we all know, rather unusually favorable, and this circumstance naturally redounds somewhat to our advantage in the matter of through freight traffic, but like all other western lines we feel rather severely the effect of Panama Canal competition.

Local business and meteorological conditions in the territory served by us are unusually favorable. This region has made very substantial progress in agriculture, stock raising and metalliferous and coal mining during the past two years, and some sections are enjoying rather extraordinary prosperity due to abundant crops and good prices.

Early and abundant precipitation promising ample water for next year's irrigation, improvements in metallurgical processes, and particularly selective flotation processes, presage a continuation and quite probably an improvement in 1926 of existing favorable conditions.

Passenger traffic here, as everywhere, is suffering severely from bus line competition and in Colorado, in



particular, to the wholly unregulated competition.

2. There should be, and doubtless will be, a substantial increase in the capacity of transportation lines in order to offset obsolescence and to meet anticipated increased demands justified by existing business conditions and highly favorable elements giving promise of still more favorable conditions in 1926.

3. It seems probable that a relatively greater expenditure will be required in 1926 for additions and betterments than for equipment although the latter item will be large; this, perhaps, for the reason, among others, that in the matter of improvements and betterments carriers normally pursue a progressive and closely coordinated policy, while in the matter of equipment emergency conditions can usually be met by emergency provisions and careful distribution of available equipment through the cooperation of the Interstate Commerce Commission.

4. Changes in existing federal and state regulatory laws are looked upon with distinct disapproval, with the possible exception of some modification of Sub-section 6 of Section 5 of the Transportation Act conferring upon the Interstate Commerce Commission express authority to legalize and encourage practicable consolidations in advance of the formulation of a comprehensive plan for the consolidation of all railroads into a few systems. With such latitude it is believed that this problem would largely solve itself along practical economic lines to the great advantage of both carriers and the traveling and shipping public.

Rates Through Panama Canal Should Be Regulated

By H. E. Byram

Receiver, Chicago, Milwaukee & St. Paul Railway

1. I THINK the outlook for freight traffic in the Northwest territory for 1926 is favorable providing, of course, that the crop conditions during 1926 are as favorable or more so than in 1925.

2. and 3. The Railroads of the country, particularly those of the western section, have been so successful in handling the peak loads of traffic during the past two years with their present facilities that there does not seem to be any immediate necessity for extraordinary increases in facilities to take care of the increasing traffic that may be expected during the next four or five years. There are places where improvements will be necessary, but generally speaking, it seems to me the facilities of the railroads are adequate to take care of a considerable increase in business without any unusual or universal additions. But, of course, there



will be need of additional cars and locomotives from time to time as the traffic grows.

4. Speaking for a trans-continental railroad, I think the most important need at the present time is some federal legislation regulating the rates or charges for handling freight through the Panama Canal. I believe this can best be accomplished by extending the jurisdiction of the Interstate Commerce Commission over coastwise traffic handled through the Panama Canal. In that way a proper relation between the charges of the boat lines and those of the railroads can be established and maintained and afford both the water and rail carriers an opportunity to adjust their rates to a permanent and equalized basis, which cannot be done at the present time because there is no regulation of rates of the coastwise water carriers.

I also think some changes in that part of Section A of the Transportation Act of 1920 relating to labor matters should be made along lines which are now being worked out by the leaders of the railway brotherhoods and railway executives and which, if agreed upon, will, no doubt, be submitted to Congress for that purpose.

Prospects Bright in Southeast

By L. A. Downs

President, Central of Georgia Railway

1. PROSPECTS for passenger and freight traffic in Central of Georgia territory were never brighter than those for 1926. The development of the southeast has attracted the attention of the entire country.

This territory is just beginning to develop and utilize its vast resources of clay. Textiles show not only an increasing output but a growing diversification of high grade products. The steel industry is turning out many finished products in addition to pig iron. A program of diversification is followed on the farm, and the southeast is no longer dependent upon a single crop. People in other sections of the country are recognizing as never before the south's undeniable advantages of long growing seasons, ample rain fall, mild winters, great variety of crops and low priced lands, which make this section a good place in which to live and make a living. There is every indication that the southeast is just entering upon a period of growth and expansion that will surpass the most optimistic expectations. Nineteen-twenty-six promises to be a record year of progress. The flow of traffic has been somewhat retarded by the embargo against certain classes of freight destined to Florida points, but this situation has rapidly cleared up during the closing weeks of 1925.



2. In forecasting the extent to which it will be necessary to increase the capacity of the railways in the southeast, so that they may render as good service as has been rendered during the last few years, it is perhaps well to judge the future by the past. In the ten year period from 1915 to 1925, the revenue tonnage of the Central of

Georgia Railway increased 122 per cent. There is every reason to believe that the next ten years will witness an equal or a larger increase. Railways in the southeast, like those in other parts of the country, are endeavoring to keep ahead of the business demands of the territory. Improvements and enlargements of facilities that are now in progress assure an even higher standard of service.

3. In order to expand their capacity for increased service it will be necessary for the railways in the southeast to provide both increased equipment and other additions and improvements. As to which is the more imperative depends upon the individual carrier. As the business of the territory increases, efficient and economical operation dictates the replacement of motive power and equipment with larger and more powerful locomotives, freight cars of greater capacity, and steel passenger coaches.

4. Railway management is the trustee of huge investments in a utility which renders an indispensable service to the public. The power to regulate railway properties emanates from the people. If the people have correct information concerning transportation affairs they can be depended upon to do what is right and fair. A sound public policy toward transportation will offer assurances that the railways will not be restricted by adverse sentiment in measuring up to their obligations as a factor in the development of this growing country. The future of the railways depends upon their ability to secure new capital. Capital cannot be coerced. Capital can only be attracted by assurances as to safety of the investment and of a reasonable rate of return. Freedom from undue restriction and from adverse legislation by the various regulatory agencies interpreting public policy will enable the railroads to render the prompt, complete and dependable service which is beneficial to every branch of business, industry and commerce.

Transportation Act Should Be Let Alone

By J. E. Gorman

President, Chicago, Rock Island & Pacific Railway

1. THE prospects for railway traffic in the western territory were never better than presently they appear for 1926. Traffic for the year 1925 has generally reached record proportions, and were it not for the fact that the revenues of most of the lines were greatly reduced on account of the partial failure of the winter wheat crop, their traffic and revenues for 1925 would probably have been the greatest in their history. The southwestern section of the territory was visited by a long and serious drouth, and this of course curtailed the crop and naturally affected business in the territory. Recently there has been ample moisture, and the crop prospects at this time are unusually good. Railroad revenues in the western territory are greatly dependent upon the condition of agriculture, and if crop conditions are favorable in 1926, I look for a record traffic.



The passenger revenues of all carriers are greatly affected by bus competition, as well as by the use of private automobiles, which of course greatly reduces local passenger traffic. The through business of the railroads has been relatively good in 1925, and I see no reason why the same condition should not exist in 1926.

2. The railways in the western territory have been spending large sums for additions and betterments to their property, both in roadway and equipment, and presently I think are generally in the best physical condition they have ever been to handle increased traffic. At the same time I think their expenditures, both for roadway improvements and new equipment, will be large during 1926, and with a continuation of the expenditures which they have annually made in the last few years, I see no reason to anticipate any extraordinary requirements in this regard. Generally, I think their expenditures for roadway improvements will be greater than that required for new equipment.

4. I think the present Transportation Act should be left as it is, and in my opinion no amendments to it are necessary for the consideration of Congress, and particularly do I favor the continuation of the present United States Railroad Labor Board, although I know in the minds of many railroad men a different program is proposed in this regard.

A cessation of legislative enactments, both federal and state, which restrict and hamper the railroads in their efforts to develop a fully efficient and satisfactory transportation service, is needed, and with favorable consideration of the Interstate Commerce Commission permitting an increase in freight rates of the western railroads, will I think enable them to render every satisfactory service without any change in legislation.

Traffic Prospects—Condition of Railways—Legislation

By P. E. Crowley

President, New York Central Lines

TRAFFIC PROSPECTS.—The freight and passenger traffic prospects for 1926 are reassuring. The indications point to a satisfactory traffic during the first six months of the new year; and unless the flow of industry and trade is interrupted by unusual causes, the balance of the year should also reflect a favorable volume of business.

The business outlook, as judged by activities in the territory served by the New York Central Lines, is promising, and reflects a continued demand for goods.



Consolidations.—The progress of railroad consolidations which may be expected during the coming year depends largely upon amendments to the Transportation Act which may be made by Congress at the present session making consolidations possible. Under the law as it stands actual consolidation of a number of railroads into one company cannot be effected until the Interstate Commerce Commission makes a final grouping of the railroads of the country. If the law is amended so as to permit voluntary consolidations when approved by the commission, it is expected that during the year considerable progress may be made in consolidating roads of a system now under common control but owned by separate corporations. The

gathering of the railroads of the country into larger units as contemplated by Congress can best be brought about by first unifying existing systems and then enlarging them.

Capital Expenditures and Financing.—Expenditures of the New York Central Lines for new equipment, materials and supplies, including rails, will be about normal. At the present time the New York Central Lines have no commitments requiring extensive financing; but we cannot say what may develop during the course of the year. The New York Central has recently financed part of its requirements by the sale of stock and hopes that that method may be open to it in the future if and when it is deemed wise to resort to it.

Railway Physical Conditions.—The present physical condition of the railroads is better than at any time since the termination of federal control. The supply of equipment is more than sufficient to meet the present traffic demands; and, moreover is in our opinion in generally good condition.

Net Earnings.—In the event our forecast of a continued satisfactory volume of traffic during the year materializes, and barring unusual circumstances, the outlook for net earnings is encouraging.

Legislation.—It would appear that the best interests of the railroads and the public would be served if the new Congress would enact amendments to the laws now in effect respecting consolidations, eliminating the existing requirement that a final grouping of the railroads of the country shall be made by the Interstate Commission prior

to consolidations, and adding provisions that will facilitate such consolidations as may be approved by the I. C. C.

As stated by the President in his message to the last Congress, the labor provisions of the Transportation Act have not proved satisfactory in all respects either to the public, to the railroads or to their employees. In considering amendments which should be made in the law, the rights and the obligations of all the interested parties—the public, the railroads and the employees—must be considered. Inasmuch as the public has a greater interest in the continuity of transportation service than any other business or industry in the country, it is essential that any amendments to the present laws should be so formulated as to insure greater security against the interruption of the transportation service.

Most Pressing Problem.—In volume of freight moved, in promptness and general efficiency of service, the year 1925 has been an outstanding one in railroad history, and viewed as a whole, the railroad situation is more satisfactory and reassuring than it has been in several years. There is a better understanding and greater co-operation than has heretofore existed between the railroads and their employees and between the railroads and the public, and the regulatory bodies having jurisdiction over transportation matters. One of the most serious problems which confronts the railroads is shared in common with other property owners, and that is the ever increasing burden of state and municipal taxes. There is immediate need for reform in this direction similar to that which has been effected by the Federal Government.

Business Prospects Are Excellent

By Frank H. Alfred
President, Pere Marquette Railway

IF, under our American institutions, we could infuse into the discussions of our economic problems that same sensitiveness that is shown by the doctors in the treatment of a contagion or an affection, our law courts, in considering a departure from a precedent, or our bankers in considering a business proposition, there would be little difficulty in forecasting rather accurately the prospects for railway traffic for the year 1926. The unknown element in our analysis is ourselves. How we will act under certain conditions is the all important problem at this time. Whether there will be any economic disturbances arise at this session of Congress is an important factor in the future.



We had such an instance two years ago when we, as a people, allowed ourselves to become stampeded by the revelations in connection with the Tea Pot Dome incident. That involved something like one hundred thousand dollars of graft, at the outset, but it cost the workers and the business men of this country billions of dollars when this incident subverted public confidence. Occurring as it did on the eve of a presidential election, the recession in business which was an inevitable result of such a scare was prolonged into the year 1925. We lost ground in 1924 and it took several months in 1925 to regain our terrain, as our military men are wont to say.

There were those optimistic souls who saw in the Federal Reserve Act a cure for the recurring off periods of business each presidential year. What was lost sight of in this connection was that the analysts stressed too greatly upon the importance of the federal bank act and too little upon the general confidence that is required to make its aims effective. The Federal Reserve Act has justified itself. It justified itself during the year 1924, but it could not prevent business men and the investing public from becoming alarmed in the face of the increasing wave of unrest.

The year 1925 is drawing to a close with business on an accelerated upward trend. Save the anthracite strike, there is hardly a cloud in the horizon. The usual recession in December will not be prolonged, if there is a recession. The casual excuse of inventory taking will not be offered by business men as an alibi this year. For

several weeks, manufacturers in the Michigan territory have been hauling in raw materials in larger quantities than for many years, and this despite the fact that railroads are practically giving express service. Certain it is that never in their history have they given as uniformly good service as today, notwithstanding a record of 1,100,000 car movement a week. The service that the railroads have given during 1925, therefore, would not warrant such movements of raw materials, if our industries did not expect even greater production than has obtained for several months. Indeed, there are several large industries in various cities in the Pere Marquette territory that are planning broad extension programs. Many of the industries that were expanded during the war period—expansions which a year ago it was thought made the production maximum beyond the supposed absorption point—are working over time. Many are putting on additional forces this month. Some of them have production schedules that extend three months into 1926.

While the Michigan grape growers and the sugar beet growers have suffered a set-back this year, and these are important lines of husbandry, nevertheless our farmers in the territory are enjoying greater prosperity and their purchasing power is considerably higher than it was last year or even two years ago at this time.

The outlook for building and construction work is generally fair in the various cities and villages. In Detroit, this promises to be particularly heavy, and Detroit's record during the first ten months of 1925 averaged \$15,000,000 monthly. Among these buildings, there was one theater a month. With the construction of homes, came the extension of water mains, sewers, gas, electric lights and telephones. These also involved great outlays.

With reference to the outlook for passenger traffic in the territory, there are few causes for hope of greater traffic other than what arises through prosperity and the incidental tendency for travel. It would seem that as far as local traffic is concerned, the motor bus and the privately owned automobile have made as deep inroads upon our traffic as immediate conditions will permit. Through the winter months, those passengers who foresake the motor bus for the railroad train are numerous, but the moral that this experience teaches as to the effect of this form of competition upon railroad service, does not seem to remain long in the public mind, after the first warm spring days.

While manufacturing, agriculture, mining and other in-

dustries expanded considerably during the war period, and with this expansion, of course, new production records were made, there was never a time since the close of the war when the buying public could absorb the full capacity of these factories until this year. With better conditions in Europe and likewise a greater purchasing power on the part of our farmers at home, a number of these industries have been approaching the peak of their capacity. Meanwhile the railroads in this territory generally have expanded relatively, and their present potential is well up to the demands for transportation service that may be required of them. There have been no embargoes raised in or against the territory in which the Pere Marquette Railway operates. True, just at present there are embargoes in Florida, which are effective in Michigan, but these have been issued to protect the citrus crop in the Palmetto state, and they are intended to take care of a particular situation there—not in this section. Notwithstanding the better service which is now available to the shippers—and it is the best in the history of steam railroad transportation—the coming year will be marked by heavy

outlays again on improvements and betterments. Greater transportation capacity will be brought about through these outlays. They provide for increased and improved facilities generally.

The service which the railroads have given during the past three years is, in itself, a justification of the Transportation Act of 1920. No large user of railroad transportation would suggest its repeal. The great interest manifested at the various meetings of the Shippers' Regional Advisory Boards is evidence of this. These gatherings have proved a valuable aid in the solution of transportation problems. There has not been a word of criticism of the Transportation Act itself offered at these gatherings and they are made up of men who know conditions.

With the new Congress entering upon its duties, it is my firm belief and opinion that the Transportation Act should be left alone, other than perhaps amplifying it to enable voluntary consolidations to take place. The proposals for forced consolidations should be avoided at all costs as a dangerous interference with business.

Business Prospects of the Year 1926

By T. C. Powell

President, Chicago & Eastern Illinois Railway

WE can look forward to the business prospects of 1926 with a good deal of confidence. There are only a few dark spots existing at present, and I believe these will be diminished, if not eliminated, within the next two or three months.

The anthracite coal strike has been in progress for several months, but has encountered a peculiar situation of affairs, which was probably not anticipated when the strike was called, in that with everything pointing to an early and hard winter, the weather has continued reasonably mild and has reduced the necessity for a large proportion of the purchase of coal for domestic

heating that otherwise would have taken place. It is true that the first cold weather struck New York and other parts of the country earlier than for a generation, but these low temperatures have not been maintained.

Another feature that should be noted is the constant decrease in the number of what may be termed domestic hearths, and by that I mean that the individual interested in the purchase of coal for the heating of his own domicile, particularly in the eastern territory and in the larger centers of population, is transferring his abode to the apartment houses, and the furnaces of the apartment houses can burn different kinds of fuel, so as to give a greater latitude than when restricted to the output of the anthracite fields. My belief is, therefore, that the coal situation will be stabilized shortly after the first of the year.

My second reason for believing that 1926 will be prosperous, is the settlement of the European situation. The evident desire of the nations of Europe to establish close relations with the United States, by settlement of the debt problem, is an encouraging indication of increased purchases by those nations in the United States, and such purchases will afford a larger employment.

The reduction in taxes, the program for which has been

largely agreed upon, will release funds which will go into other channels, and increase the purchasing power of the nation generally. There is a psychological effect in this situation that means far more than the actual money, and the President of the United States well appreciates the substantially good effect that will come from tax reductions and from a reduction in the expenses of the general government.

Simplification and conservation in business, if followed by the state, national and municipal authorities, will tend to distribute this prosperity and this psychology throughout the whole country. Never before in the history of the United States, has the interest of the people been so aroused with relation to the sections of the country furthest removed from the great business and manufacturing areas.

I have in mind that the renewed prosperity of the railroads in New England is attracting the favorable attention of the rest of the United States, while the substantial development of the Pacific Coast and of the Gulf Coast, is bringing nearer and nearer together the distant parts of this country, with a corresponding favorable effect upon the intermediate sections and communities, all of which seem to be very much nearer to each other than ever before.

This widespread interest has already resulted in building up new markets and new producing sections. Undoubtedly, the telephone, telegraph, radio, aeroplane and the wonderful record made by the railroads have all contributed largely to these happy conditions.

The population of the United States has increased beyond expectations, and as the industries must find consumers among the farmers, the farmers in turn must find consumers among the employees of the industries. The capacity of the farmer to buy is the foundation upon which the national prosperity rests, but the farmer's ability to buy is also based upon his ability to sell, and without customers and without transportation, he would not have any market for the products of his labor. Every day marks some new discovery which tends to add to the



comfort and happiness of the people of this country.

My conception is that the year 1926 will be without an inflated prosperity, but will be a year of substantial and

lasting good business evenly distributed from the Atlantic to the Pacific and from the Canadian border to the Gulf of Mexico.

Railroad Outlook Justifies Optimism*

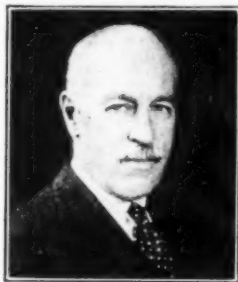
By W. W. Atterbury
President, Pennsylvania Railroad System

THE end of the year finds the railroad position stronger than it has been for a long time. The volume of traffic handled has been large. While that has been a welcome fact, it is not the most welcome fact. The greatest cause for confidence in the future is the evidence on every side of the desire on the part of the public to co-operate with railroad management to improve railroad service and to enable the railroads to respond to the need for greater and more efficient transportation.

The recent annual message of the President of the United States, the latest report of the Interstate Commerce Commission, and the activities of regulating authorities generally—all give evidence of a healthier relationship between government and the railroads.

The trouble has not been so much with the actual letter of laws regulating railroads, as with the spirit in which some of the laws have been interpreted.

That spirit is changing to one of confidence. Railroad



officers can feel the strong supporting forces of public opinion backing them up to an ever greater extent. It is putting life, spirit and enthusiasm into the men in charge of the affairs of railroads. These men feel a deep responsibility to an enlightened public opinion. They feel that they are trustees for vast property interests. They have a high regard for the welfare of that great army of employees devoting their lives to the railroad service. Their responsibility is great, and when that responsibility is exercised with a knowledge that its discharge in a spirit of fidelity to all interests will be encouraged and supported by government and public, the possibilities of continued and substantial progress are increased beyond estimate.

The foregoing is fundamental. Upon such foundations we can build a railroad structure in which investors can trust and upon which the public can rely. All else is detail. The American people have the greatest railroad plant in the world. They have a more competent and loyal set of railroad officers and employees than has any other country. With this railroad plant, manned by such officers and employees—all publicly regulated in a constructive spirit—a service can and will be given to the public which will constitute at all times a foundation of national prosperity.

I am, therefore, optimistic about the railroad future.

*A statement to the public made on December 28, 1925.

Ability to Sell More Railway Stock Needed

By W. R. Scott
President, Southern Pacific Lines in Texas and Louisiana

1. RAILWAY traffic, both passenger and freight, on these lines for 1926 should compare favorably with 1925, although with the continued building of good roads the local passenger business continues to disappear, largely caused by the privately owned automobile. We had a very severe drought in about sixty-four counties in Texas in 1925 which materially affected these lines, but with the good rains since September the ground is thoroughly soaked and this condition will be beneficial to the starting of next year's crops.

2. Owing to the lavish expenditures made by the railroads since the war, improving their transportation layouts by additions to terminal facilities and to equipment, the business of the last two years has been successfully handled and in a manner wholly satisfactory to both the shipping public and the railways. This has largely been brought about by a closer contact and cooperation between the shipping public and the railways, and while it will be necessary for the railways to continue to expand and add



to their facilities commensurate with the growth in business, such expenditures, while constant, will be gradual and tend to a more even and ratable expenditure and, therefore, to a more nearly stabilized ratio between operating expenses and revenues.

3. The increased capacity will need to be provided by—

(a) Additions to equipment to care for increasing traffic and due to obsolescence of existing equipment, and

(b) Through additions and improvements, such as second or additional tracks and increased terminal facilities. It will be hard to determine which will be relatively the greater.

In a general way, I consider that the railroad situation is favorable. It seems to be the disposition on the part of the public generally to allow the railroads to earn enough money to enable them to keep pace with the growing needs of the country and furnish necessary improvements to satisfactorily handle the business. This has not reached a point, however, where the railroads can add to their improvement by the sale of stock. The healthy situation would be one in which the railroad earnings would warrant investors purchasing reliable stocks and thereby enable the railroads to do their financing more readily.

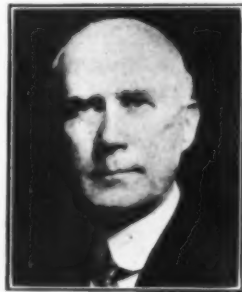
Needed Improvements in Regulation

By William Sproule

President, Southern Pacific Company

1. PROSPECTS for railway traffic both passenger and freight in 1926 are very encouraging throughout the widespread areas served by Southern Pacific Lines. There is nothing now in sight to give cause for any misgivings on that subject.

2. In the past three years we have been making such improvements in our lines and extensions of them that when the work is completed, which will be in the course of the next year, we can handle the traffic with ease, allowing for most liberal increase in its volume. Since the war we have made such large additions to our motive power, rolling stock and facilities generally that we will enter upon the new year ready to take care of all the business that may offer.



3. We are, however, placing orders for more motive power, passenger train cars and freight cars so as to keep up with the growth of business, and the Pacific Fruit Express, which handles refrigerator cars and refrigeration service for perishable freight on our lines, is giving an order for 5,000 new cars and in that company Southern Pacific are half owners, the Union Pacific owning the other half.

4. As to changes in the federal laws and their administration, I do not believe in constantly meddling with or frequently changing existing laws. The tendency is not to allow the law to stand on the statute books long enough for seasoned trial. The Transportation Act of 1920 specifically has been valuable in pointing the way to avoiding railroad strikes by arbitration and has also pointed the way for a constructive attitude toward the railroads in an effort to maintain their earnings upon a compensatory basis. That the law and its administration have not succeeded fully in accomplishing these purposes does not discredit the law. It may point to the need of strengthening the law. The principle of arbitration, for example, is as valuable for the men as it is for the railroad company. Arbitration by a tribunal representing the men, the company and the general public interest, is so correct in principle that only the details of its application leave room for discussion. With the principle established, application of that principle to given issues becomes a matter of detail capable of solution among reasonable men. Upon this the public insist, anyway, as they do not intend any longer to be the victims of disputes among railroad men.

With this attitude, the public is disposed to recognize the rights of the men and of the companies, with one notable exception.

This exception consists in the failure of the public to recognize that when the people put their savings into railroad stocks and bonds, these savings are in effect dedicated to the public. They serve a public purpose. As the legal phrase is, they are affected by the public interest. Hitherto that public interest has been used as a pretext for discipline put upon the railroads. It has been made a reason for regulating them in their earnings, in expenses and in their net returns of money upon the property. The signs are only recent that those who make our laws and administer them are giving heed to the fact that

money which is dedicated to the public use through transportation service is entitled to consideration because of its being so dedicated and is entitled to protection at the hands of the public, for if the money dedicated to the public service is not entitled to a just and liberal reward, what money is there and flowing through what channel that is so much entitled to adequate reward?

The money of the citizen can be invested in a multitude of ways. Money is a commodity for which there is a competitive demand and the railroads have to compete for it in common with other industries seeking the same money. It is in the general public interest that the railroads be allowed to earn such just and liberal returns upon the money as will justify the public in furnishing it to them.

The failure of broad policy in the law and its administration looking to this result is beginning to be recognized and the Transportation Act of 1920 shows the first serious trend in this direction. It falls far short of what is needed. It points the way, however, and we realize that those who have in their hands the administration of the law are serious students of the subject.

In one particular, administration of the law has worked to the great prejudice of the transcontinental railroads. I refer to the fact that they have been forced out of the traffic competitive with the Panama canal. Since the war the transcontinental railroads have not been allowed, under the long and short-haul clause of the Interstate Commerce Act, to participate in the traffic which before the war was an important part of their transportation service. This is partly, doubtless, because Uncle Sam is in the shipping business and partly because of the agitation of the intermountain states against suspension of the long and short-haul clause that formerly did allow the transcontinental lines to participate in this coast to coast traffic. The transcontinental carriers have thus been deprived of a great volume of traffic to their great loss and without compensating advantages to the objecting states and communities.

On the contrary, those states and communities have also suffered by the loss. No train moves through any state or through any city without disbursing money throughout that state and within that city. Every trainload of freight crossing the continent may be said to drip money along every mile of its travel from coast to coast—in wages, fuel, lubricants, water, upkeep, yard and terminal service, and in every aspect of its movement.

Of all this money the intermountain states and communities are deprived, because of their theory that the railroads should not be permitted to make rates to compete with water routes, in order that they may participate in the coast to coast traffic, unless they are also willing to make those rates apply to intermediate points where the competition does not exist and where it would practically bankrupt the railroads to apply such rates. The intermountain states can gain nothing by their contention, but really lose money because of it.

The transcontinental railroads believe their plea is just that they be permitted to participate in the traffic from coast to coast as they did before the war. They believe that their doing so will be of the greatest good to the greatest number. It will help to stabilize the railroad situation by giving them an important tonnage now denied them. The profit, small in the unit, would be

important in the aggregate, under rates having reasonable relation to those of the Panama route upon sanction by the Interstate Commerce Commission.

The fact is the public has today a broader knowledge

of the railroad business than ever before. As they understand it better it is probable that both regulation by law, and its administration by earnest minds charged with that responsibility, will be still more constructive and useful.

Traffic Prospects and Railway Capacity in the South

By W. L. Mapother

President, Louisville & Nashville Railroad

1. THE unusual commercial activity throughout the south, and particularly in the territory served by the Louisville & Nashville Railroad, during the year now coming to a close, has resulted in the movement of a volume of freight traffic never before realized in the history of this company. I think, as a whole, the same may be said with respect to the other southern roads as well. The prospect for 1926 is, of course, problematical, but all indications point to a steady and continued growth in the industrial progress and there is every reason to believe that the railroads will continue to handle their share of the increased business.



2. Through the expenditure of vast sums during the past few years for increased transportation facilities, and because of the greatly enhanced efficiency of operation, I believe the southern railroads have so enlarged and improved their transportation capacity as to enable them

to handle the maximum traffic volume in a manner equally as satisfactory as has marked their operations during the past year.

3. There will, of course, be substantial expenditures made during 1926 for additional improvements to increase the transportation capacity, but probably the principal portion of such work will be centered in bringing about refinements in the existing plant rather than in the construction of new lines or other transportation development; and a similar distribution of the expenditures as between improved equipment and roadway facilities, as in the recent past, will likely continue.

4. One of the most important factors contributing to the unprecedented service in the past year was the paucity of agitation designed to influence legislation affecting common carrier operations. The lawmakers, in creating the Transportation Act, provided on the whole a splendid piece of railway legislation; it is now functioning better than at any time since its enactment five years ago, and I do not believe it should be disturbed or that further regulation of the railways should be effected except it be clearly of a constructive character and specifically calculated to promote the public interest.

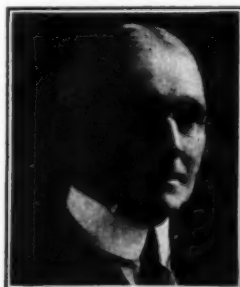
"Stabilized Regulation" Needed

By C. E. Schaff

President, Missouri-Kansas-Texas Lines

1. BUSINESS conditions in the southwest are generally encouraging. While traffic volume is likely to be affected adversely in the forepart of 1926, as it has been in the fall of 1925, by short grain and cotton crops in certain sections, favorable agricultural prospects in the early summer will warrant expectation of traffic volume for the year equal to that enjoyed in 1925.

2. The railroads in southwestern territory are adequately equipped to handle at least twenty-five per cent more traffic than they have enjoyed in 1925, without material increase of physical capacity, particularly if the movement is as uniformly distributed over the seasons as has been the case in recent years. Present standards of service certainly can be maintained, even with largely increased traffic, assuming that gross revenues are sufficient to permit the expenditures necessary to proper maintenance. There, of course, will be continuing need for capital expenditures, but I anticipate that for some time to come the principal requirement will be for improvement in facilities and equipment which will enable increased



efficiency and economy in operation, rather than for enlarged capacity.

4. The federal laws at present covering regulation of the conduct of railroads may not be said to be perfect, but experience since 1920 certainly has proven that they are practicable and workable. Minor changes may be desirable, but from the standpoint of results secured, I should say that greater benefits may be anticipated from the administration of the present laws in the spirit in which they were written than from changes in the laws. So far as results are concerned, it makes little difference what the law may declare, unless the agencies charged with its administration so apply the law as to secure to investors in railroad enterprise the fair compensation essential to continued efficiency and convenience in service.

Uncertainty as to changes which may be made in the law regulating the conduct of railroads, and as to the spirit in which the law may be administered, is always a disturbing and disheartening influence. What the railroads need most is, not so much change in the laws, but rather a stabilized regulation which is not continuously readjusting policies and principles to meet shifts in the political wind. The railroads need a sense of security that they may go definitely ahead with their plans and projects without constant fear of impending change in the principle of regulation under which they must be conducted.

Will Congress Refrain from Adverse Legislation?

By Ralph Budd
President, Great Northern Railway

1. THE business outlook, and, therefore, the prospects for continued large volume of freight and passenger traffic during 1926, are good, judged by the activities in our territory.

2. There is no prospect of an increase in business which will in any way tax the present capacity of the railroads of the Northwest.

3. The expenditures for additions and betterments are very well balanced between equipment and fixed property.

4. I believe that any changes that are made in the Transportation Act should be only such as will facilitate railroad operation by railroad operating forces. The most pressing question is whether Congress will refrain from further adverse railroad legislation.



Too Much Regulation of Railroad Income

By C. T. Jaffray
President, Minneapolis, St. Paul & Sault Ste. Marie Railway

1. I THINK the prospects for railroad traffic in the Northwest for the first part of 1926 are some better than a year ago. This is caused by the fact that the two crops which we have had have been so good and the increased buying power of the country. The latter part of 1926 will depend entirely upon the out-turn of the crop.

2. I do not believe it is going to take very much in the way of increased facilities to take care of the business in this territory for at least a few years. The reason for this is, our territory is not growing as fast as it will because of the backset which the farmers had during the period of 1920-1924.

3. I think the increased capacity of railroads which may be required in a few years to come will be largely that of improved equipment and the necessity of maintenance of the properties with additions in some places that will increase the flow of traffic at less expense.

4. There are a good many changes I would suggest in the federal laws regulating railroads, but I am hardly in a position to express this opinion for I do not seem to agree with the opinions held by other railroad executives. I do feel, however, that the regulating of our income in Washington and the more or less regulating of our expenditure in Chicago by a different body is wrong in principle, and would not be tolerated in general business, for it cannot be successful and must be constantly affecting the proper working out of railroad problems.



No Legislation Needed Unless as to Consolidations

By E. J. Pearson
President, New York, New Haven & Hartford Railroad

1. UNLESS something unforeseen should occur to disturb general business conditions, the prospects seem favorable for a volume of traffic in the year 1926, at least equalling that of the year 1925.

2. As far as the New Haven is concerned, extensive capital expenditures are not necessary for increasing capacity. There are some yard improvements, engine terminal and shop facilities, etc., to be provided this year, together with additional power, all of which will be helpful in the better handling of traffic.

3. The above expenditures will be about equally divided between new equipment and other additions and improvements.

4. No changes in legislation are needed except perhaps that in view of the recent expression of the Interstate Commerce Commission, an amendment eliminating compulsory consolidations and permitting voluntary groups by the railroads themselves, subject to approval of the commission, would be a step in the right direction.



Changes in Legislation Are Undesirable

By W. J. Harahan
President, Chesapeake & Ohio Railway

1. SO far as we can see the traffic outlook in our territory for 1926 is good. This applies chiefly to freight, however, as passenger business has been decreasing and it is difficult to foretell just what the effect of automobile competition will be in the future.

2. I do not think it will be necessary for the capacity of the railroads in this section to be increased to any great extent to enable them to render as good service in the near future as has been done during the last three years. The chief requirement will be to keep the motive power and equipment in good condition and up to the present capacity.

Of course, there will have to be some improvements to enable increased efficiency of operation, and purchases of equipment to keep up capacity.

3. This question is practically answered in the preceding paragraph. I think relatively greater expenditures will have to be for equipment.

4. I feel that the present legislation is reasonably satisfactory and do not think it advisable to make any important changes until there has been an opportunity for a thorough working out of the present law, so that we may know just what changes are necessary and desirable.



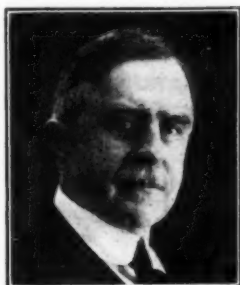
Traffic Prospects in New England

By J. H. Hustis
President, Boston & Maine Railroad

1. THE freight traffic of New England is to a large extent dependent on the prosperity of the country, and especially of the Middle West. From present indications in New England we look for some improvement in 1926.

Passenger traffic has shown continued losses to date, but with a reduction in the rate of loss in recent months. A study of conditions affecting automobile use has shown that while many persons have returned to travel by train on our lines in order to avoid increasing highway congestion, recent buyers of automobiles with whom the element of novelty is still new are on the roads in larger numbers. Consequently some continuing loss of the passenger revenues is indicated, with the unregulated interstate motor bus operations a contributing factor.

2. We do not believe it will be necessary to increase capacity materially. The effort will continue to be along lines of modernizing plants, yards, engine terminals, etc., and with the object of obtaining greater utilization of existing plant facilities.



No Legislation Needed

By J. M. Kurn
President, St. Louis-San Francisco Railway

1. MY personal view is that there will be a continued large volume of freight traffic in our territory during the year 1926. As to passenger traffic—there is every reason to believe that the inroads on our passenger revenue from motor bus competition will increase rather than diminish and this will affect very seriously our local traffic. This may be partially offset by long haul traffic, which on our line is holding up well.

2. We are increasing our capacity by the purchase of new equipment in an amount approximating \$11,000,000 for delivery early in 1926. This equipment comprises 4,000 new freight cars, 14 new passenger coaches and 25 new locomotives. In addition to this, our budget will call for an expenditure of \$6,000,000 for other improvements to the property.

4. I'm not so concerned with Congressional legislation—rather inclined to the view that there is no necessity for any particular action on the part of Congress at this time. I have no suggestions to offer as to amending any existing railroad law, or laws, respecting consolidation, nor do I feel that any part of the Transportation Act should at this time be modified.



Need of Increased Terminal Capacity

By J. M. Davis
President, Delaware, Lackawanna & Western Railroad

1. I BELIEVE we will continue to have a heavy volume of freight traffic for the first five months of 1926. A continuance of these favorable conditions thereafter will depend upon the crop outlook.

2. Increased terminal capacity is to my mind most essential if the railroads in this territory are to keep abreast of the constantly increasing traffic demand. The ability to handle traffic is largely predicated upon terminal capacity. The most efficient and expeditious road movement may be largely nullified by inadequate terminal facilities.

3. This increased terminal capacity will have to be provided by an intensive development of the present facilities and the construction of additional facilities, including increased and improved equipment. In view of the fact that this development must in practically all cases occur at or adjacent to large centers where values are high, the expenditures to carry same on will of necessity be tremendous.

4. For some time past there has been a recession from regulatory railroad legislation and this condition has without question to a substantial extent contributed to the excellent showing made by the railroads in handling so well the tremendous volume of traffic in 1925. In my opinion the transportation interests will be best served by refraining from the enactment of additional federal railroad legislation at this time.



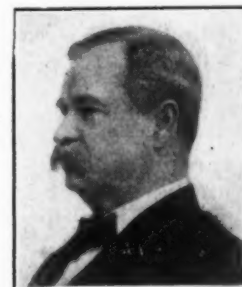
Traffic Prospects Favorable

By J. R. Kenly
President, Atlantic Coast Line Railroad

1. WE regard the prospect for railway traffic—both passenger and freight—during 1926, as very favorable.

2. During this year, we increased our facilities in many ways to take care of the increased business of the last half of the year and the anticipated increase during 1926. We purchased additional freight and passenger equipment, built new shops and a terminal freight yard at Tampa, Florida, enlarged other freight yards at important points, added to some of our freight stations and station tracks, are now extending some of our branch lines in Florida, and have under construction about twenty miles of second main track in Florida south of Jacksonville at congested points.

Our second main track between Richmond, Va., and Jacksonville, Florida, will be completed and in operation by the first of next month.



Consolidation and Labor Provisions Can Be Improved

By Carl R. Gray
President, Union Pacific System

1. MY judgment is that railway traffic, both passenger and freight, for the first six months of 1926 will compare favorably with the same period in 1925. In general there have been more abundant crops, with fair, and in some cases very good, prices. In a country so largely dependent upon agriculture it is not safe to prophesy at this time about fall conditions. Such indications as can now be observed, such as condition of fall-sown wheat, are favorable.

2 and 3. Answering questions 2 and 3 together: in our territory, at least, we do not see the necessity for any very striking program for additions and improvements. All western roads have a capacity materially in excess of present or early future demands. I expect better equipment purchases than last year, with a somewhat smaller budget for additions and improvements.

4. It is apparent that federal railway laws will be somewhat modified with respect to consolidations and in the labor section, and I believe that both in the light of nearly six years' experience can be improved upon in the general interest.



This Year Probably Will Be Better Than Last

By A. T. Dice
President, Reading Company

1. THE prospects for railway traffic, both passenger and freight, in this territory (notwithstanding bus and truck competition) are very good, and unless something unforeseen happens I expect 1926 to be better than 1925.

2. The railroads are today furnishing better service, and the relations between the railroads and their patrons are better today than they have been at any time within my recollection. Of course work will have to be done and extensions be made to take care of the increased business.

3. Increased capacity will have to be provided by probably nearly equal expenditures for increased and improved equipment and for additions and betterments.

4. If the Congress will amend or enact legislation providing for voluntary consolidations it would undoubtedly promote consolidations. I think that if we will refer to the President's message where he says, "The age of perfection is still in the somewhat distant future, but it is more in danger of being retarded by mistaken Government activity than from lack of legislation," and profit by that, we will all be better off.



Present Conditions Are Promising

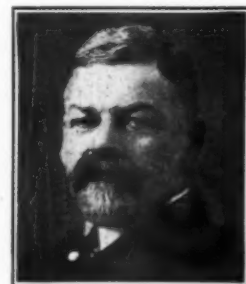
By W. B. Storey
President, Atchison, Topeka & Santa Fe System

1. THE present outlook is for an increase in both passenger and freight traffic in our territory. It is not likely that this will be large, but citrus fruit, grain, and cotton have been rather under normal this year and soil conditions today are much better than a year ago. Therefore, so far as present conditions can mean anything for next year they are promising.

2. There has been such a considerable advance during the past three years in the condition and capacity of the railroads in our territory to handle traffic that they ought to be able to keep abreast of any likely increase in traffic very easily. A reasonable program for improved power, shops, terminals, and sidings ought to meet the demand without much in the way of new second track or additional extensions.

3. There should be a considerable replacement of old equipment with new and improved units without much increase in numbers, but probably the larger part of improvements should consist of other additions and betterments designed primarily to facilitate movement of traffic and secondarily toward operating economies. Frequently, of course, these two objects are attained at the same time in the improvements.

4. While the Transportation Act of 1920 is not perfect, there has been developed no pressing need for a change and it would seem better not to try to amend it until the need and the remedy both became clearly outlined.



Continued Improvements Needed

By Daniel Willard
President, Baltimore & Ohio Railroad

1. I REGARD the prospects for railway traffic during the year 1926 in the territory served by the Baltimore & Ohio Railroad as good.

2. I think it will be necessary in the future as in the past to continue capital expenditures upon the railways for additional equipment and other facilities, not only in order to take care of the growing business of the country, but to handle the present business on a more efficient and economic basis.

3. The increased expenditures in this connection in the future will probably be on about the same relative basis as in the past.

4. In my opinion no changes are necessary in the present federal laws concerning railways, although it is probably desirable that some amendment should be made to the labor provisions in the Transportation Act as they now stand.



Capacity of Main Lines Approaching Danger Point

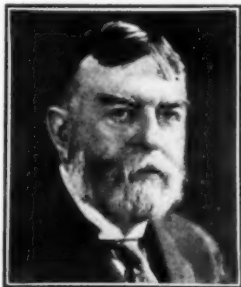
By L. F. Loree
President, Delaware & Hudson Company

1. I THINK traffic will show some improvement in the early part of 1926 over 1925, and, as to the latter part of the year, that it will depend upon crop conditions.

2. I think that on our lines of heavier traffic the margin of capacity to take care of additional business is nearing the danger point. One has not to look very far into the future to feel that the imminent calamity of insufficient railway facilities confronts the industries of the United States.

3. Every avenue of improvement should be taken advantage of. Some additional construction of new railroads, additions and improvements to existing lines, some increase in equipment, and particularly improvement therein by added capacity of vehicles and in the motive power by taking advantage of means already in sight, the use of heavier steam pressure and compound cylinders, the use of powdered fuel, feed water heaters, boosters, and other devices.

4. The railroad people insistently urged upon the public that the Transportation Act of 1920 was the greatest piece of constructive legislation that had been passed in recent times. It would not speak very much for their acumen if they were now to discover in it difficulties sufficiently grave to demand changes in it. They have held out to the public that what was needed was time to work the matter out, and certainly five years is not sufficient time for that purpose. If there are some difficulties in the application of the law, these difficulties should be plainly defined and additional effort made to overcome them. I think the danger of opening up the Transportation Act for amendment is so great that it would be foolhardy to undertake it.



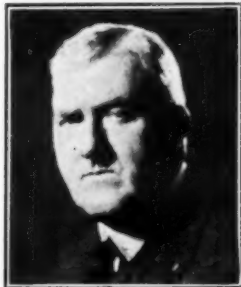
Conditions in the Pocahontas Territory

By A. C. Needles,
President, Norfolk & Western Railway

1. PRESENT indications are that railway traffic during 1926 will approximate that of 1925. Because of the demonstrated ability of the carriers to render prompt and efficient service, shippers generally are holding their inventories to current requirements, thereby insuring a steady flow of business.

2. By large capital expenditures already made and being made currently, I believe the railroads in this territory are keeping well abreast of transportation requirements, and will be able to continue to render the same good service.

3. The physical condition of the Norfolk and Western is



better than it has ever been, and I believe the physical condition of most railroads is considerably better than normally.

During the past three or four months the coal loading on the Norfolk and Western has been heavier than at any previous period, but despite this we have been able to keep a full car supply at all times. We have ample motive power and generally the car supply is good.

The present physical condition of our property is such as to permit a low operating ratio, which, with a continuation of good business, will be reflected in satisfactory net earnings.

4. Since the passage of the Transportation Act of 1920, the railroads of the country have made rapid progress in attaining a satisfactory condition and rendering efficient transportation service. There may be provisions of the act which might be improved upon, but any changes proposed should receive most serious consideration.

Proposed Changes in Transportation Act

By E. E. Loomis
President, Lehigh Valley Railroad

1. PROSPECTS for railway traffic in the territory served by the Lehigh Valley for 1926 are excellent. It is true that our traffic is handicapped to a considerable degree at the present time by the suspension of work by the miners in the anthracite fields and this condition, of course, will continue until mining is resumed. On the other hand, all the important industries, aside from anthracite production, are busy and there is every reason for expecting this to keep up during the new year. Passenger traffic is satisfactory and showing some increases in long haul business.

2. You ask whether I think it will be necessary for the capacity of railways in this territory to be increased to enable them to give as good service as generally has been rendered during the past three years. I am not prepared to answer this for the other lines, but so far as the Lehigh Valley is concerned, we can handle a greatly enlarged volume of traffic with our present facilities. We have developed our terminals at New York Harbor and elsewhere with an eye to the future and the whole system can meet an expanded business and maintain present standards of operation.

3. In view of my reply to your second question, I can only say that we are keeping our property fully abreast of all demands upon it. We have recently placed orders for some cars, changes are being made in clearances at certain points to meet the requirements of the newer equipment and higher loading on flat cars, and the railroad generally is being fully maintained.

4. I do not think that it is necessary to make important changes in the Transportation Act at this time. President Coolidge's recent message to Congress has covered this angle of the railroad situation adequately, in my judgment. If the I. C. C. is given authority to approve voluntary consolidations of carriers made by themselves and an agreement can be reached in regard to the prompt and fair adjustment of labor troubles nothing further would seem necessary at this time.



Railway Development from the Manufacturer's Viewpoint

"Prescription for abundant traffic is for roads to perform their part as leaders of national growth"

By Alba B. Johnson

President, Railway Business Association

HOMEWARD bound on an ocean liner last July the Editor of the *Railway Age* and the author of this article held autopsy on previous forecasts of railway traffic and consequent facility requirements which we had severally made—the editor in a Railway Business Association dinner speech last year, myself in the annual statistical number of the *Railway Age* for 1925. The editor now recalls to me that aboard ship he mentioned my statement and I replied, "That article wasn't so."

According to both our computations, if the historical cycle repeated itself the ton-miles for the peak month of 1925 would exceed those of 1923 by not less than 15 per cent and require a substantial speeding up in the provision of facilities. Generally speaking that outlook for railway purchases has been disappointed and the traffic has exceeded that of 1923 perhaps by 5 per cent or 6 per cent, which the roads have handled promptly and satisfactorily with more than 100,000 good-order cars and between 4,000 and 5,000 good-order locomotives in storage at the October peak.

What happened? What of the future?

Reduced Railway Inventories Curtailed Purchases

A number of factors seem to have figured in the result. To begin with, the railroads, like manufacturers and merchants, have taken advantage of the increased celerity and reliability of transportation to cut down inventory. It is within my knowledge that a number of large lines are carrying from a half down to a third or even a quarter of the supplies previously kept in stock, and I understand that this tendency has been general on the roads. In the one year 1925 this change in policy has meant a tremendous reduction in two items—purchases and the traffic which directly and indirectly results from production of goods bought. In future years the average quantity of such supplies consumed will be as large as ever, growing with the country; and when inventory has been stabilized on the new basis the annual purchases on this account will be what may be called normal. It is improbable that in a year of active general business we shall ever see in that respect a repetition of 1925. The transition has been accomplished once and for all.

Greater Utilization of Equipment

Another element has falsified predictions. There has been in cars an increased average capacity and in locomotives both increased average power and fuller utilization through the development of long runs. The extensive installation of larger cars and more powerful loco-



motives since the war in replacement of those retired, and in additions, reached in 1924 and 1925 a point where the work done per rolling stock unit in use greatly exceeded previous performance. In 1925 both the number and the total capacity of cars installed has been greater than of those scrapped, but installed locomotives have totalled considerably less than those retired whether measured by number or by tractive pounds. Progress in multiple tracking and in signalling and improvement of terminals, though less conspicuous, has been a factor. The Regional Advisory Boards, moreover, through systematic distribution of cars have cut down by an important margin the number required for a given volume of traffic. How these factors will affect the future cannot be closely estimated. At least the substitution of heavier equipment for stock retired and the lengthening of runs on more lines will continue for some years before we reach a limit; and when such limit is passed the roads can handle each new increment of freight with units of motive power increasing more slowly than the traffic. On the other hand, the very excellence of service and economy of operation may be expected to strengthen our agricultural, industrial and commercial expansion. Stranger things might happen than railway replacements, additions and betterments growing as rapidly as at any time in the past; and especially if the traffic-producing occupations are stabilized seasonally and one year with another the consequent wear and tear on railway facilities will call for maintenance and replacement relatively greater than in the past years of extreme ups and downs in general business.

With regard to the motor truck I merely remark, as was said in a recent letter of the Railway Business Association to Chairman Aishton of the Association of Railway Executives, that there seem to be grounds for asking whether automotive development has not on the whole given the railroads more traffic than it has deprived them of. Highway congestion, too, appears to have set a limit at least on immediate further growth of motor traffic.

Attitude of Railways as a Factor

The factor, however, which in my judgment has most influenced 1925 business, whether railway supply or general, is the attitude toward the future which many railway managers seem consciously or unconsciously to act upon. Considering our national activities as a whole, down to say 1906, they were conducted in the mood of pioneers in a new country. It was assumed that the United States would grow more rapidly than older countries. It did grow more rapidly. Nearly every one had his gaze on the future. At all times a great part of industry and commerce were engaged in the construction and enlargement of plant with which to do business not yet in existence but expected. Such business came among other reasons precisely because of the prosperity diffused by the preparation itself.

In marked degree this was the history of the railroads

and the railroads were a vital chapter in the history of general prosperity. They did much more than prepare themselves to carry the traffic next year or the year after. They "bet on the United States." They had faith. They built for the longer future. And their faith made them whole. The business created by their own participation in pioneering and preparation became traffic for them and the earnings justified the outlay.

Political affliction and during the war federal control, together with pretty general famine among stockholders over a long period, transformed the roads into bond-heavy enterprises reluctant to take chances. Since they stored a surplus of rolling stock at the peak, it would be too much to say that for 1925 they provided only what was needed for that year. Their calculated economies were verified by the results. Probably, however, it is well within reason to conjecture that if they had estimated a traffic sufficient to exhaust the surplus and very much more and had prepared in 1925 for a further normal increase in 1926 and 1927, the traffic of 1925 would have equalled the estimate.

Importance of Railway Purchases

To me it is surprising that railway officers apparently give so little weight to their own purchases or abstinence from purchasing as an influence upon their traffic and earnings. Doubtless all of them perceive the relation between their purchases and the direct traffic in goods delivered to them and to manufacturers making such goods. Regarding this traffic they may well say that at best it is heavy stuff paying low rates and that they themselves pay the freight bill in the price. What appears to be neglected is the vast secondary buying due to the increased purchasing power resulting from their own disbursements—the expenditure by the individual industrial employee for food, clothing, shelter, furniture and all other necessities and comforts. It has been asked how many times a dollar so spent turns over. The true answer is that short of a depression, with its hoarding, the end never comes; for there are only three things a man can do with his money—pass it on, hoard it or bank it; and if he banks it he is adding to the accumulation of capital, the basis of his or somebody's investment in enterprises furnishing traffic during construction and in operation.

Shall Railways Live from Year to Year?

It may be sound policy to develop the United States less rapidly in the future than in the past. If for an era

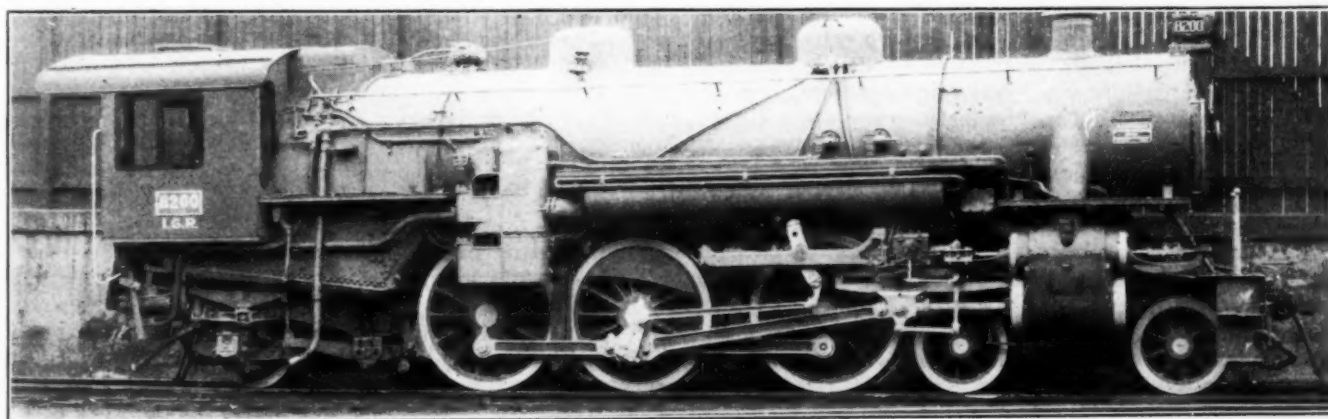
now begun agriculture, industry and commerce are to live from hand to mouth the true course for railways undoubtedly is to do the same. But I have yet to detect any such tendency or purpose on the part of these other elements. They are going forward with unabated vigor, manifested just now especially in the development of new integrations and combinations, as well as in new directions, especially the "super-power" movement and the invasion of fields all over the world for production of our raw material and supplies. Everywhere the eye of management is fixed on a future big with expansion. Shall the railroads alone live from year to year? In a recent article the *Manufacturers Record*, using the unexpected construction of new mileage in Florida as its minor premise, cautions the roads lest they be overtaken unawares by traffic demands. Quite as timely is the warning that American competition with foreign rivals in export trade will only succeed if our internal rail transportation is intensified so as to neutralize the greater distances between centers in the United States than between centers in Europe and that with all convenient speed our roads must modernize every feature of their property lest they be overwhelmed with high cost on the one hand and radicalism on the other.

Stabilization of Business

Some conservative members of Congress, in touch with currents of thought throughout the country, especially in the West, and observing the tendency to nibble away by legislation the managerial functions of the railroads and the independence of the Interstate Commerce Commission, are seriously anxious about the menace of government ownership. They believe that so long as the country is prosperous this danger may lie dormant; but they fear what will happen at the first depression. The peril lies in peaks and valleys of industrial and business activity. The preventive is stabilization, and no element in the country can do so much to stabilize business as a whole as the railroads can accomplish by stabilizing their own purchases. This can best be done by budgetary programs of maintenance and improvements extending over several years.

The price of avoiding either failure in foreign trade or federal seizure of the properties is continuance of prompt service and progress toward lower cost. The prescription for abundant traffic is to perform their quota as leaders of national growth, staging their own prosperity instead of staging a limit upon it.

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Built for the Japanese Government Railways by the American Locomotive Company

3 ft. 6 in. Gage; Cylinders, 450 mm. by 660 mm.; Boiler Pressure, 180.6 lb.; Tractive Power, 29,800 lb.; Equipped with Worthington Feed Water Heater



Railways to Continue Improvement Programs Into 1926

Study of the budgets now under consideration indicates somewhat greater activity than in 1925

By E. T. Howson

THE railways of the United States and Canada probably will spend somewhere between 750 millions and 900 million dollars new capital for equipment and other additions and improvements to their properties, exclusive of current repairs and maintenance, in 1926. In other words, they will continue the liberal programs for the enlargement of their facilities which have characterized their administration since the war at a rate equal to or slightly above that which has prevailed during the past two years. This conclusion is based on consideration of present and prospective traffic, on views which have been expressed by railway executives in letters to the *Railway Age*, and on a study of the individual programs which 39 representative roads with an aggregate mileage of approximately 160,000 miles have given us, checked by comparison with similar information given us for the same purpose during the last three years with the amounts actually spent during those years.

This forecast is significant in view of the fact that the facilities available have been sufficient to enable the roads to handle within recent months the largest volume of freight traffic in their history with surplus capacity and with no congestion other than locally in Florida. It indicates the determination of the managements to continue to keep their properties sufficiently ahead of normal demands to enable them to meet any requirements that may reasonably be expected.

In reviewing the information given in this article it should be borne in mind that it is not intended to intimate that it is a complete review of the expenditures the railways will make during 1926. The capital expenditures

made in any year depend largely upon the traffic actually moving in that year. This is especially true of equipment orders, which usually increase more in proportion than the increase in traffic and correspondingly decline when traffic declines. In view of the immediately prospective traffic it seems probable that expenditures for equipment will be larger than the budget figures given below would indicate.

This article is merely an attempt to set forth conservatively the improvements which the roads are planning to make. Many of the roads have not yet determined the capital expenditures which they will make this year, while those programs which are summarized here may be altered radically and undoubtedly will be added to materially before the year is ended if business continues good. A survey of those budgets which have been completed affords an index, however, of the attitude of the managements of the roads towards the future and the measure of their belief in the necessity for the amplification of their facilities.

In attempting to predict the trend of expenditures for a year in advance, the *Railway Age* recognizes the uncertainties involved. Many events may transpire which may radically alter the policies of the roads relative to expenditures. Yet with all their pitfalls and their uncertainties business today is based largely on forecasts of future events and on the interpretation of present tendencies.

The forecast of railway expenditures as a feature of its annual statistical issue was first introduced by the *Railway Age* in 1923 and published in its issue of January 6, 1923, at which time it was estimated that the roads in the

United States and Canada would spend more than \$700,000,000 in the year then opening. When it is recalled that in only one year in the ten years preceding that date had the records of the Interstate Commerce Commission shown a net average of investment in road and equipment by the carriers in the United States greater than this amount and that the average annual increase during this decade had been less than \$500,000,000, the temerity of that forecast is evident. Yet the demand for facilities was so pressing during that year that the railways in the United States alone spent \$1,059,149,426 of new money or 50 per cent more than we estimated.

One year later we estimated, in the *Railway Age* of January 5, 1924, that the roads of the United States and Canada would spend \$1,200,000,000 during that year, whereas data compiled by the Bureau of Railway Economics indicated that the Class I railways of the United States alone spent \$874,743,000. With the inclusion of expenditures for the railways in Canada and the smaller railways of the United States, it is evident that the amount spent exceeded one billion dollars.

A year ago it was estimated, in the *Railway Age* of January 3, 1925, that the railways of the United States and Canada would spend \$1,350,000,000 for additions and improvements to their properties during 1925. This estimate was too high, as later events have shown, for while the Class I railroads of the United States alone authorized approximately \$1,200,000,000 in capital expenditures, the total expenditures of these roads aggregated approximately \$775,000,000 and the expenditures of all of the roads in United States and Canada approximated \$1,000,000,000. That we were not alone, however, in overestimating the expenditures during 1925 is shown by the fact that a statement issued by the Association of Railway Executives in New York City on November 19, 1924, indicated that approximately \$1,100,000,000 would be spent by the Class I roads in the United States alone during the past year. The decline from this estimate during last year was primarily in equipment, orders for which fell off sharply early in the year. There was an increase in orders for equipment in the closing weeks of the year, but payment for this equipment will be made in 1926.

The Roads Whose Budgets Are Summarized

In arriving at our estimate of the volume of capital expenditures that will be made during 1926, we have before us data from 36 roads, comprising 135,000 miles of line, including the following:

Atchison, Topeka & Santa Fe	Lehigh Valley
Atlantic Coast Line	Long Island
Baltimore & Ohio	Louisville & Nashville
Canadian National	Maine Central
Central Railroad of New Jersey	Midland Valley
Chicago, Burlington & Quincy	Minneapolis, St. Paul & Sault Ste. Marie
Chicago Great Western	Minneapolis & St. Louis
Chicago, Indianapolis & Louisville	New York, Chicago & St. Louis
Chicago, Rock Island & Pacific	New York, New Haven & Hartford
Delaware & Hudson	Northwestern Pacific
Denver & Rio Grande Western	Norfolk & Western
Duluth & Iron Range	Pere Marquette
Duluth, Missabe & Northern	Reading
Elgin, Joliet & Eastern	St. Louis-San Francisco
Florida East Coast	St. Louis Southwestern
Great Northern	Southern Pacific-Pacific System
Gulf, Mobile & Northern	Union Pacific
Illinois Central	
Kansas City Southern	

In addition, we have information concerning the work carried over by three roads with an aggregate mileage of 24,903, including the Pennsylvania, the New York Central and the Chesapeake & Ohio. The budgets of these roads

show that they plan to undertake work during the current year involving the expenditure of more than \$380,000,000.

Capital Expenditures—Class I Roads Only

1923—	\$1,059,149,426 (Bureau of Railway Economics)
1924—	874,743,228 (Bureau of Railway Economics)
1925—	800,000,000 (First nine months, Bureau of Railway Economics, last three months our estimate)
1926—	750,000,000—\$900,000,000 (our estimate)

If other roads spend at the same rate, it is clear the appropriations for 1926 will exceed \$800,000,000 for the railways of the United States and Canada. From present traffic indications there is a greater likelihood of these appropriations being increased than decreased as the year advances. Indicative of this is the statement made by the executive of a prominent western road when sending us his budget data that "this program is tentative, its expansion or contraction depending upon developments of the business situation. At the moment I see nothing in the situation that would suggest any material contraction."

Many Appropriations Are Carried Over

In addition to these sums appropriated for new projects, over \$120,000,000 will be spent during the year by the roads mentioned in the list given above on work undertaken during 1925 and carried over into 1926. In the prosecution of large projects, it is inevitable that many expenditures cannot be completed within the limits of a calendar year. Thus, data collected by the Bureau of Railway Economics show that the Class I roads carried over from 1924 into 1925 unexpended authorizations aggregating \$403,996,106, of which \$145,121,292 was for equipment and \$258,874,814 for roadway and structures. This amount was considerably in excess of the amount carried over from 1923 into 1924, which was estimated by the Bureau of Railway Economics at over \$300,000,000. This increase in unexpended authorizations in 1924 was due to the authorization of a considerable number of expenditures late in the year, following retrenchment in the spring and early summer, due in part to the uncertainty in the political situation.

In addition to the amount carried over into 1925, additional appropriations were made during the first nine months of 1925 by Class I railways reporting to the Bureau of Railway Economics aggregating \$609,426,642, divided between \$210,885,736 for equipment and \$398,540,906 for roadway and structures. The total appropriations up to September 30, 1925, including the sums carried over from 1924 were, therefore, \$1,013,422,748, and the total of these roads for the entire year approximated \$1,200,000,000. Of this amount \$529,145,044 had been expended prior to September 30, leaving unexpended authorizations of \$484,277,704, of which \$101,587,103 was for equipment and \$382,690,601 for roadway and structures. While the figures are not yet available to show the expenditures on these authorizations during the three closing months of 1925, it is estimated that they will approximate \$250,000,000, leaving more than \$225,000,000 to be carried over into 1926. This amount has, of course, been supplemented by the unexpended portions of appropriations made during the last three months of the year, so that the total carryover for the roads as a whole is in excess of \$425,000,000.

This estimate is borne out by data furnished us by 33 roads with an aggregate mileage of 117,582, which roads, as already stated, have carried over into 1926 appropriations aggregating more than \$120,000,000. If the carryover on the remaining mileage in the United States and Canada is in proportion, the total carry-over will exceed \$400,000,000.

Among the larger projects included in this carry-over

is such work as the construction of a bridge across the Mississippi river at Fort Madison, Iowa, by the Santa Fe; the construction of a 27-mile line from Immokalee to Deep Lake, Fla., by the Atlantic Coast Line at a cost of \$900,000; the completion of the Edgewood cutoff of the Illinois Central between Edgewood, Ill., and Fulton, Ky., which will involve a total expenditure of nearly \$20,000,000; the completion of the Port Richmond (Philadelphia) grain elevator, car repair shops at Reading and other work amounting to more than \$7,500,000 by the Reading; the completion of the extensive mileage of new lines in Oregon and Arizona, and other roadway improvements involving the expenditure of \$10,700,000, by the Southern Pacific-Pacific System, etc. The work carried over by individual roads other than those mentioned runs into large sums, aggregating more than \$31,000,000 on the Pennsylvania, \$20,000,000 on the New York Central System, \$25,000,000 on the Santa Fe, \$7,500,000 on the Reading and \$6,000,000 on the Union Pacific.

In distinct contrast with the situation in the United States, where the railway problem is rapidly working itself out and the roads are approaching a position of stability, the situation in Canada is still one of uncertainty regarding the future of the railways, with the result that development of the properties is being retarded. While earnings in Canada improved materially late in 1925, the uncertainty regarding the ultimate outcome of the Canadian government's experiment in railway operation is such as to lead to conservatism in expenditures. Furthermore, while eastern Canada is fairly populous and the railways there are fairly highly developed, the typical railway in the west is a single track line of light traffic. While a considerable mileage of new lines is under construction to reach undeveloped areas in the west and while this construction will be continued in 1926, it is at a much slower rate than prevailed during the period immediately prior to the war. The budget of the Canadian National, however, contemplates the expenditure of more than \$17,400,000 next year, of which more than \$15,800,000 will go for roadway and structures involving improvements at a large number of points.

Many Budgets Not Available

In the compilation of our data we are confronted with the fact that many roads are proceeding more leisurely with the preparation of plans for their improvement work this year than in past years. Some roads, such as the Louisville & Nashville and the New York Central, do not follow the practice of preparing budgets, but appropriate for each project as occasion arises. Obviously, it is possible to include in our tabulations only the figures for expenditures actually authorized by such roads, without including appropriations that may be made later in the year. To a lesser degree we are confronted with the same problem on those roads which follow the practice of preparing budgets, for it is impossible for them to anticipate all of the needs that may arise during a year.

Entirely aside from these exceptions, however, many of the roads which normally complete their budgets by this time of the year have given little consideration to them this season. This is undoubtedly a result in large measure of the lack of pressing necessity for increased facilities, such as has prevailed at some times in the recent past. With the performance of the last year fresh in mind, it is only natural that the managements should not feel the necessity for urgent consideration of their budgets far in advance of the opening of the construction season or the necessity for equipment. For these or other reasons budgets are not yet completed on many roads, including the Chicago & Eastern Illinois, the Nashville, Chat-

tanooga & St. Louis, the Western Pacific, the Chicago, Milwaukee & St. Paul, the Central of Georgia, the Chicago & North Western, the Northern Pacific, the Buffalo, Rochester & Pittsburgh, the Missouri-Kansas-Texas, the Virginian and the Chicago & Alton.

The Purpose of the Appropriations

The appropriations referred to above will be expended for the wide variety of facilities which go to make up a composite railway property. They will provide for the construction of new lines, for additional main tracks, for new and enlarged shop and other terminal facilities, for the strengthening of the roadbed and bridges, for the reduction of grades, for signaling and train control, for the replacement of inadequate or obsolete coaling and water stations with larger and more modern equipment, etc. A large amount will also go for the purchase of new cars and locomotives and for the reconstruction of older equipment to strengthen and modernize it.

The tendency to devote an increasing proportion of the money available for improvements in roadway as compared with equipment is still apparent. During 1923 the Class I roads of the United States spent \$1,059,149,426 for capital improvements, of which \$681,723,991 or 64 per cent went for cars and locomotives and \$377,425,435 or 36 per cent went for roadway equipment. During 1924, \$874,743,228 was expended for capital expenditures, of which \$493,608,460 or 56 per cent went for equipment and \$381,134,768 or 44 per cent for roadway and structures. Of the total appropriations authorized during the first nine months of 1925, including the carry-over from 1924, however, \$356,007,028 or 35 per cent went for equipment and \$657,415,720 or 65 per cent for roadway and structures.

The budgets for 1926 show the same tendency, for of the more than \$380,000,000 which has been definitely allotted by the roads from which we have data, approximately \$250,000,000, or 65 per cent, is set aside for roadway improvements. This condition is not unexpected because of the large economies that are possible through improvement in the permanent plant and also because of the surplus of equipment that has prevailed throughout the last year. That the roads do not intend, however, to allow this condition to lull them into a false sense of security is indicated by the large orders for equipment which were placed during the closing weeks of last year, and, as above indicated, a continued heavy movement of railway traffic undoubtedly would stimulate orders for equipment.

A study of the improvements which are in contemplation for 1926 indicates a continuance on an increasing scale of plans for work which has for its principal object the reduction in the cost of operation. Characteristic of such improvements is the authorization by the Great Northern early in December of the construction of a tunnel eight miles long through the Cascade mountains in Washington that will lower the summit 500 ft., shorten the line eight miles, eliminate 2,000 degrees of curvature and remove the necessity for 6 miles of the snow sheds now required on the western slope.

Some of the Larger Budgets

Among the roads which are contemplating large programs for next year are the Atchison, Topeka & Santa Fe, with a budget including carry-over from 1925 of \$55,000,000; the Canadian National, \$18,200,000; the Chicago, Rock Island & Pacific, \$20,944,000; the Central Railroad of New Jersey, \$13,923,000; the Denver & Rio Grande Western, \$10,896,595; the Florida East Coast, \$22,750,000; the Illinois Central, \$41,384,000; the Louisville & Nashville, \$20,000,000; the Norfolk & Western,

\$18,448,810; the Reading, \$15,875,794; and the Union Pacific, \$36,100,000.

Some of the Larger Budgets

Atchison, Topeka & Santa Fe.....	\$55,000,000
Southern Pacific-Pacific System	44,328,000
Illinois Central	41,384,900
Union Pacific	36,100,000
Florida East Coast	22,750,000
St. Louis-San Francisco	21,000,000
Chicago, Rock Island & Pacific.....	20,994,286
Louisville & Nashville	20,000,000
Norfolk & Western	18,448,810
Canadian National	18,200,000
Reading	15,875,794
Central Railroad of New Jersey	13,923,000
Great Northern	13,500,000
Denver & Rio Grande Western	11,896,595

The Santa Fe will spend approximately \$9,300,000 for equipment now on order, and will undertake improvements costing approximately \$30,000,000. In addition, it is carrying over a considerable amount of work from 1925, including a bridge across the Mississippi river at Fort Madison, Iowa, which will involve a total expenditure of about \$6,000,000.

The Canadian National will undertake a large number of improvement projects, most of which are relatively small individually, but which amount to large figures in the aggregate. Thus, it expects to spend over \$1,800,000 for improvements in classification and engine terminal facilities at 141 points and \$2,156,000 for the construction of 405 bridges and culverts.

Of the \$20,944,000 included in the Rock Island's budget, \$9,168,000 is set aside for equipment and \$11,776,000 for roadway and structures, including \$1,283,000 for new lines, \$1,400,000 for the reconstruction of bridges, \$950,000 for track elevation and \$577,000 for improved water facilities.

The Denver & Rio Grande Western plans to spend slightly more than \$5,000,000 for equipment and a similar amount for roadway and structures, the largest project being a 43-mile extension which is estimated to cost \$1,900,000.

The Florida East Coast plans to continue its extensive program of enlargement of facilities with appropriations of \$1,000,000 for new lines, \$6,000,000 for second track, \$3,000,000 for classification yards, \$1,000,000 for shop equipment and facilities and similar amounts for signaling and bridges.

The Illinois Central is continuing the liberal program of expenditures which it has maintained for several years, with a budget involving an outlay of \$12,160,000 for equipment and \$28,000,000 for roadway and structures. The latter sum includes \$10,238,000 for the completion of its new line between Edgewood, Ill., and Fulton, Ky., \$2,262,000 for classification yards at three points, and \$4,376,000 for shop facilities at three points.

The Louisville & Nashville is also continuing its program of improvement and enlargement of its facilities which it has been prosecuting actively for several years, and while it does not follow the principle of preparing a budget, it has already contracted for the delivery of equipment and materials involving an expenditure of approximately \$10,000,000 and also has under way construction work involving a total expenditure of approximately \$10,000,000.

The Norfolk & Western is another road which has been engaged in a heavy improvement program for several years. Among the expenditures which it has in mind for next year is the construction of two classification yards at a cost of \$5,346,000, shop facilities at three points involving an expenditure of \$3,128,000, signaling 102 miles of line at a cost of \$930,000, grade crossing elimination cost-

ing \$2,350,000 and the purchase of equipment at a cost of \$2,160,000.

The Reading is planning to spend \$2,370,000 for equipment and \$3,600,000 for miscellaneous improvements in addition to carrying over \$7,585,000 of authorizations from 1925.

In addition to carrying over \$10,700,000, the Southern Pacific-Pacific System plans to spend \$9,830,000 for equipment and \$23,800,000 for roadway improvements during the new year. This includes \$3,700,000 for new lines, \$2,800,000 for new classification yards and \$1,000,000 for new shops.

The Union Pacific is another road which has made liberal expenditures for a number of years to keep its facilities abreast of the demands upon it. In addition to carrying over work costing more than \$6,100,000 from 1925, it is appropriating \$30,000,000 for new improvements, including \$10,200,000 for equipment, \$2,600,000 for second track and \$6,000,000 for a wide variety of miscellaneous improvements.

\$50,000,000 For New Lines

While it is to be expected that appropriations will go more and more for the improvement and enlargement of existing facilities rather than for the construction of new lines, several hundred miles of extensions are contemplated for next year, which will involve the expenditure of more than \$50,000,000. The Atlantic Coast Line has appropriated \$900,000 for the construction of a 27-mile line from Immokalee to Deep Lake, Fla., and has just received authorization from the Interstate Commerce Commission for the building of an additional line 40 miles long between Perry and Monticello, Fla., which will afford a new entrance into western Florida; the Chicago, Rock Island & Pacific has appropriated \$1,283,000 for the construction of three extensions with an aggregate mileage of 43; the Denver & Rio Grande Western will build 43 miles of new lines at

Some of the New Lines

Southern Pacific-Pacific System.....	324 miles	\$11,500,000
Illinois Central	164 miles	10,238,000
Denver & Rio Grande Western.....	43 miles	1,904,000
Atlantic Coast Line	40 miles	1,425,000
Chicago, Rock Island & Pacific.....	43 miles	1,283,715
Florida East Coast	24 miles	\$1,000,000
Union Pacific	14 miles	720,000

an estimated cost of \$1,904,000; the Florida East Coast will build 24 miles of new lines at a cost of \$1,000,000; the Illinois Central will spend \$10,238,000 for the completion of its 164-mile line through southern Illinois and western Kentucky; the Southern Pacific-Pacific System will spend more than \$11,500,000 for the completion of 300 miles of lines on which work is already well advanced as well as for the building of 24 miles of additional lines; while the Union Pacific has appropriated \$720,000 for the construction of 14 miles of new lines.

Second and Multiple Tracks

The amount of money set aside for the construction of second and other multiple main tracks is considerably less than in recent years. The largest appropriation is that of the Florida East Coast which will construct 117 miles of second track at a cost of \$6,000,000 in addition to carrying over \$550,000. The next largest program is that of the Union Pacific which has already awarded contracts for the construction of 26 miles in Utah which will cost \$2,610,000. An important eastern road has appropriated \$1,173,000 for the construction of 29 miles of second track and another eastern road \$690,000 for 11 miles. The Pere Marquette has appropriated \$691,000 for 18 miles while a number of other roads have appropriated smaller

amounts for short sections, indicating that the expenditures for multiple main tracks will approximate \$15,000,000 to \$20,000,000.

A Number of Terminals Will Be Built

As in recent years, relatively large expenditures are contemplated for classification yards, and expenditures of this character will exceed \$35,000,000. Among the larger appropriations of this character are those of the Canadian National for \$1,907,000 at 149 points; the Florida East Coast for \$3,000,000 at four points; the Illinois Central for \$2,262,000 at three points; the New Haven for \$500,000; the Norfolk & Western for \$5,346,000 at two points; the Southern Pacific-Pacific System for \$2,795,000 at nine points; the Soo Line for \$450,000 at two points; and the Pere Marquette for \$325,000 at two points.

Approximately \$10,000,000 is scheduled for the construction of passenger and freight stations, including \$820,000 by the Illinois Central at five points; \$718,000 by the Southern Pacific-Pacific System at fifteen points; \$610,000 by the Union Pacific at six points; \$540,000 by the Reading at five points; \$500,000 by the New Haven; \$220,000 by the Norfolk & Western at two points; and \$150,000 by the Central Railroad of New Jersey at two points.

Shop Improvements

Large improvements in shops and in their equipment are in contemplation or under way. The roads which have given us their budgets show proposed expenditures of \$15,000,000 for shop facilities and \$3,000,000 additional for shop tools, indicating that the total combined expenditures will exceed \$50,000,000. Among the important shop projects are those of the Central Railroad of New Jersey involving an expenditure of \$1,500,000; the Florida East Coast for \$2,500,000; the Illinois Central at three points with an estimated expenditure of \$4,376,000; the Norfolk & Western at three points for \$3,128,000; the Southern Pacific-Pacific System for \$1,018,000 at seven points; an important eastern road at five points for \$774,000. The New Haven also expects to spend \$500,000 for this purpose, the Union Pacific a similar amount at 13 points and the Pere Marquette \$204,000.

Among the larger appropriations for shop tools and equipment are those of the Canadian National for \$438,000; the Norfolk & Western for \$400,000; the Southern Pacific-Pacific System for \$390,000; the Union Pacific for \$300,000; the St. Louis-Southwestern for \$268,000; the Pere Marquette and the New Haven for \$200,000 each and the Delaware & Hudson for \$100,000.

Train Control

Train control will again consume a large portion of the appropriations for signaling on those roads included in the orders of the Interstate Commerce Commission. The 35 roads whose budgets we have contemplate total expenditures for signaling aggregating approximately \$6,000,000, indicating that these appropriations for all roads will exceed \$15,000,000. Among the larger appropriations are those of the Florida East Coast for 190 miles, \$1,000,000; the Norfolk & Western for 102 miles, \$930,000; the Reading for 33 miles, \$652,000; the Great Northern for 273 miles, \$600,000; the Union Pacific for 123 miles, \$450,000; the New Haven for \$400,000; the Central Railroad of New Jersey, \$380,000; another eastern road, \$365,000; the Pere Marquette for \$356,000; and a central eastern road, \$300,000.

Roadway Facilities

The information furnished us includes expenditures for other roadway facilities which will aggregate more than

\$150,000,000, including work for a wide variety of purposes. Grade separation will require \$1,600,000 on the Canadian National, \$950,000 on the Rock Island, \$2,350,000 on the Norfolk & Western, \$384,000 on the Pere Marquette and \$310,000 on the Union Pacific. The Illinois Central will spend more than \$6,600,000 in the reconstruction of its terminal facilities at Chicago. The Florida East Coast will spend \$1,750,000, the Rock Island \$1,400,000 and the Great Northern \$600,000 for the reconstruction of bridges; the Canadian National \$2,156,000 for the same purpose; and the Union Pacific \$600,000. The latter road will also spend \$385,000 for the enlargement of tunnels and \$360,000 for the development of park facilities in southern Utah, while the Duluth & Iron Range will spend \$110,000 in the reconstruction of a dock.

Large Appropriations for Equipment

In spite of the surplus of both cars and locomotives which prevailed throughout last year, many roads are making appropriations for the purchase of large amounts of equipment as has been evidenced by the number of cars

Some of the Larger Appropriations for Equipment

Illinois Central	\$12,161,900
St. Louis-San Francisco	11,000,000
Union Pacific	10,200,000
Southern Pacific-Pacific System	9,830,000
Atchison, Topeka & Santa Fe	9,300,000
Chicago, Rock Island & Pacific	9,168,052
Great Northern	7,500,000
Louisville & Nashville	6,850,000
Florida East Coast	6,000,000

and locomotives ordered during the closing weeks of the year. Thus, 22 roads have definitely indicated to us that they have already decided to purchase more than \$120,000,000 worth of equipment. Among the roads with the larger budgets for this purpose are the Santa Fe which has already ordered equipment involving an outlay of \$9,300,000; the Illinois Central which will spend more than \$12,160,000; the Union Pacific which will spend more than \$10,200,000; the St. Louis-San Francisco, \$11,000,000; and the Southern Pacific-Pacific System, \$9,800,000. In addition, the Atlantic Coast Line has ordered 2,150 freight cars, 72 passenger cars and 45 locomotives within the last month.

Freight Cars

Among the larger outlays for freight cars are those of the Great Northern for 1,185 cars, costing \$3,500,000; the Denver & Rio Grande Western for 700 cars, costing \$1,722,000; the Illinois Central for 1,400 cars costing \$2,968,000; the Soo Line for 750 cars costing \$1,457,000; the Reading for 1,010 cars costing \$2,338,000; the Southern Pacific-Pacific System for 2,814 cars, costing \$6,213,000; the Union Pacific for 2,100 cars costing \$5,950,000; and the St. Louis-San Francisco for 4,000 cars.

Among the large appropriations for passenger equipment are those of the Atlantic Coast Line for 72 cars; the Illinois Central for 219 cars costing \$9,194,000; the Florida East Coast for 52 cars costing \$3,485,000; the Norfolk & Western for 43 cars costing \$1,001,000; the Southern Pacific-Pacific System for 60 cars costing \$1,884,000; and the Union Pacific for 47 cars involving an expenditure of \$1,675,000.

Among the larger locomotive budgets reported are those of the Florida East Coast for 50 Atlantic Coast Line for 45, the Frisco, the Union Pacific, the Great Northern and the Nickel Plate for 25 each, and the Southern Pacific-Pacific System for 17.

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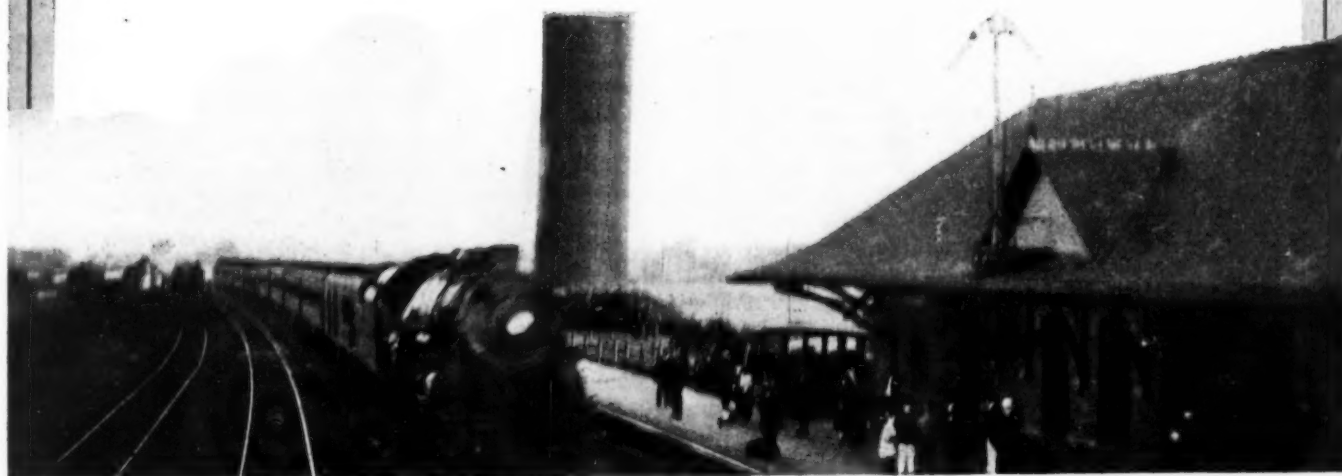
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A Review of Railway Operations in 1925

The culmination of a three-year period of increasing operating efficiency—Net still below fair return

By Julius H. Parmelee

Director, Bureau of Railway Economics

ANY effort properly to appraise the results of railway operation in the United States during the year 1925 must take into account not only the conditions existing in that year, but also those of the years 1923 and 1924. To a very marked degree, the operations of the three years belong to the same period, and represent the gradual culmination of a campaign of conscious effort, initiated by the railways at the beginning of 1923, to place railway operation on a more effective basis.

In carrying out the campaign so initiated, the railways have utilized every possible means of improvement. In the first place, they have poured several billions of dollars into their properties, in the shape of new capital expenditure. They have enlarged their facilities, have installed larger and more powerful equipment, have modernized machinery, and have carried out many other forms of betterment. They have strengthened their human organizations, by improving their personnel relationships, and by bringing the whole organism to a higher morale than has existed since before the war. As the year closed, a most important announcement indicated that the railways and the brotherhoods were in a fair way to agree on certain principles of labor legislation to replace the present labor provisions of the Transportation Act. Such an agreement does not mean the millennium at once; it will not keep down the rising tide of threatened demands for wage increases; but it does show that two of the three parties to railway labor questions can agree on basic principles of collective bargaining without sacrificing either their dignity or their rights.

Next, the railways went to the public and enlisted their co-operation and assistance. Perhaps the most effective form which this co-operation has taken has been the movement to established advisory boards of shippers, to consult with and advise the railways as to the transportation needs of the several regions. Thirteen regional boards have been established to date, with a subsidiary unit in Florida, the aggregate membership of all boards being in excess of 12,000. Not only have these boards enabled shippers and the carriers to exchange information of great value to both groups, but the added value growing out of the establishment of a new era of good will through common counsel and frank exchange of opinions has been well nigh incalculable. Another approach to the public has been through the press, where the railways and railway executives have individually and collectively told the people their plans and their problems. Last, but of no small importance, has been the general willingness of governmental officials to permit the railways to work out their own operating problems with as little regulatory interference as possible. The Interstate Commerce Commission has a difficult task. It must serve as judge, as jury, and in some cases as executioner. Under the terms of the Transportation Act, it must appraise the operations of the American railway system, and must pass judgment on the efficiency and economy of railway management. Above all, it must be fair both to

the railways and to the public whom it and they both serve.

The state commissions have also shown a general desire to be judicially fair. An interesting document of its kind was the report of the Committee on Public Relations of the National Association of Railway and Utilities Commissioners, presented at its annual convention last fall. It was remarkable both in the fact that for the first time the association had recognized the need of a Committee on Public Relations, and because the report itself was sound and showed keen understanding of the problems confronting both the railways and the shipper.

In a large sense, therefore, the record of the year 1925 may be written down as a conscious development of co-operative effort. That any effort of this kind, granted sincerity and intelligence behind it, should be successful goes almost without saying. That it was highly successful in the railway field in 1925, the story in these pages will show. Let me emphasize again that the results attained by the railways the past year were not haphazard, or unexpected, or undeserved. They were the outcome of a carefully planned program, carried out with a high degree of fidelity to the purpose of the program, and with fine co-operation from other elements of the railway economic structure.

General Summary

The year 1925 in the railway field, as in the business field generally, was in many respects one of superlatives. The heavy freight traffic was a resultant of the prosperity of the country. There has been and doubtless will be much discussion of operating records broken by the railways, which represented their contribution to economic welfare. Important as are these records, a dispassionate economic analysis of the year and its results must lay emphasis rather on the steady daily, weekly, and monthly returns than the possibly flashy results of a single period. Judged either from the point of view of single records, or from that of a high level of efficiency consistently maintained throughout the year, the operating results can be viewed with satisfaction. The financial results, as will be indicated, were not so satisfactory.

Briefly considered, the railway results of the year 1925 may be summarized as follows:

1. A heavy freight traffic, fairly well distributed throughout the year.
2. A further decline in passenger traffic.
3. With a few local exceptions, an efficient and adequate transportation service, and the virtual disappearance of a freight car shortage.
4. General averages indicating operating efficiency raised to higher levels than ever before.
5. Total operating revenues less than in 1920 and 1923, but greater than in any other previous year.
6. Net operating income, due largely to increased economy and efficiency of operation, was greater in the aggregate than in any previous year, but fell below a "fair return" on valuation, and below a return of five per cent.

on the property investment as shown by the carriers' books.

7. Rate of return on property investment was less than in 1916, although the net operating income was greater in amount than in that year. This was due to a net increase of nearly one-third in the property investment account since 1916.

Railway Traffic in 1925

In the tables, and in some of the charts that accompany this article, comparison is made of the results for the year 1925 with those in 1924 and in 1923. This extension of the comparison to a period of three rather than two years is in line with the idea that these three years represent a distinct period in railway history. It will be recalled that the year 1923 broke the record for freight traffic, and that a high degree of efficiency in railway operation was attained in that year.

There was some recession in 1924, both in traffic and in earnings, yet that year was regarded in many quarters as a reasonably normal year. Neither 1923 nor 1924 supplied a net operating income up to the "fair return" level, but in respect to the physical results of operation, both years were on a high plane. In comparing 1925 with 1923 and 1924, therefore, we are making a comparison based in the first place on one of the best years in railway history, and also on a more or less average or normal year. Both bases supply significant backgrounds against which to appraise the results for 1925.

The most important item of information regarding any year in the railway field relates to the service rendered. What was the transportation service to the public, in terms of tons and passengers, cars and miles?

In terms of revenue carloadings, the freight traffic of 1925 was the heaviest ever offered to the railways of the United States. Measured in ton-miles, it was slightly below 1923, the heaviest previous year, but 5.5 per cent above the total for 1924. The passenger-miles were slightly less than in 1924, and less than in 1923 by 5.5 per cent.

The basic table from which these comparisons have been drawn follows. It compares carloadings, ton-miles, and passenger-miles for the three years 1923, 1924 and 1925. Inasmuch as the year 1920 was also a heavy traffic year, the returns for that year have been added, for the purpose of a general comparison. The carloading figures are the cumulated weekly statistics of freight cars loaded with revenue freight; the net ton-miles include both revenue and non-revenue movement; the passenger-miles represent only the revenue movement. All the entries for 1925 are partially estimated, and are subject to revision when the final returns for the year become completely available.

TABLE I—CAR LOADINGS

1925	51,065,000
1924	48,527,000
1923	49,812,000
1920	45,118,000
Net Ton-miles	
1925	453,000,000,000
1924	429,453,000,000
1923	457,607,000,000
1920	449,125,000,000
Passenger-miles	
1925	35,900,000,000
1924	36,126,000,000
1923	38,008,000,000
1920	46,848,000,000

The outstanding feature of Table I is the extent to which the carloadings in 1925 broke all records, surpassing the next highest year—1923—by more than 1,250,000 cars, or 2½ per cent. The increase over 1924 was nearly 6 per cent.

It is not many years since the loading of a million cars of freight in a single week was a rare event. The first week in which freight traffic of such magnitude was re-

corded was in the year 1920. In that year the railways reported five million-car weeks; there were none in either 1921 or 1922; in 1923 there were 21, while in 1924 the number was 11. Up to the middle of December, 1925, a total of 20 million-car weeks had been reported, with the probability that the pre-holiday slackening of trade will have prevented any additional weeks.

While the number of million-car weeks in 1925 was slightly under the aggregate for 1923, the record for 1925 was more consistent. From the middle of July to the middle of December every week reported a million cars or more, except only the two holiday weeks at Labor Day and Thanksgiving. Again, the record for a single week was broken in August, with an aggregate of 1,124,436 cars. If the general trend of the past three years is maintained, we shall soon see an average loading of a million cars per week. In fact, the record for 1925 of more than 51,000,000 cars in 52 weeks began to approach that average.

A more detailed analysis of the freight traffic in 1925 will be made at a later point, with a discussion of the trend through the year, the contribution made to the total by the several groups of commodities, and certain other aspects.

In terms of ton-miles, the year 1925 was not a record breaker, although it came close to the top. The estimated total of 453 billion net ton-miles for the year fell below the corresponding total for 1923 by 4½ billions, which was a recession of one per cent. The total for 1925 was greater by about one per cent than in 1920, the year next below 1925, and greater than in all other previous years.

More than once in the past the trend of carloadings and of ton-miles has seemed to diverge. Thus in 1924 it was pointed out that although carloadings in that year were greater than in 1920, the ton-miles were less. In 1925, the number of carloadings exceeded the total for 1923, while the ton-miles did not. The reason is the same in both years. It lies in the almost phenomenal growth in the movement of miscellaneous and manufactured goods, which add carloadings to a relatively greater degree than ton-miles.

The passenger traffic, as measured in revenue passenger-miles, again fell off in 1925. Since the peak was reached in 1920, there has been an almost continuous recession in the demand for railway passenger service, every year except 1923 showing a decline under the next previous year. The estimated total for 1925 is 35.9 billion passenger-miles, which is a reduction of 0.6 per cent under 1924, of 5.5 per cent under 1923, and of 23 per cent under 1920. While the recession was not great in 1925, it follows several other recessions, and leads to a renewal of the inquiry as to when equilibrium will be reached between the declining local passenger business and the increasing or at least stationary long-distance service. That such a balance can and will be arrived at is the opinion of well informed observers of the situation.

Reference to Charts A, B and C will show the monthly trend of the freight and passenger traffic during 1925, compared with the years 1923 and 1924. For purposes of convenience these charts are grouped with all the others that accompany the text of this article, and appear on pages 34, 35 and 36. Charts A and B deal with the freight traffic, while Chart C covers the passenger traffic in terms of passenger-miles.

The Trend of Freight Traffic in 1925

Chart A shows the average weekly carloadings in each month of 1925, compared with the two preceding years. Chart B shows the monthly net ton-miles in the same way. Studying both charts together, it is evident that the second half of 1925 was a period of relatively heavier movement than the first half. In a general way, 1925 ran close to

the other two years during the first three months, between them during the next four months, and well above them during the final five months. In the aggregate, as has already been stated, the carloadings for the year were above those for both 1923 and 1924, while the ton-miles were well above 1924 and only slightly below 1923.

Turning to the carloadings, we may look into the figures for each group of commodities for an explanation of the heavy loadings in 1925. Table II gives an estimated separation of the carloadings in 1925 by groups, compared in each case with the annual average of the previous five years, 1920 to 1924 inclusive.

TABLE II—REVENUE CARLOADINGS BY COMMODITY GROUPS

	1925 (Estimated)	Five-year average 1920-1924
Grain and grain products.....	2,290,000	2,287,995
Live stock	1,550,000	1,639,844
Coal	8,780,000	8,693,892
Coke	600,000	537,546
Forest products	3,750,000	3,171,384
Ore	1,795,000	1,785,636
Mdse., L.C.D.	13,350,000	11,106,613
Miscellaneous	18,950,000	15,774,838
Total	51,065,000	44,997,748

Scrutiny of Table II throws much light on the freight traffic of 1925, its character and its composition. Compared with the previous five years as a base, the movement of grain and grain products remained stationary, live stock declined, while all other groups increased. The increases in ore and in coal and coke were relatively small. Coke by itself showed a good increase, and the movement of both coal and coke held up remarkably well in view of the strike of anthracite miners on September 1, and the practical cessation of anthracite coal movement after the stocks on that date had been marketed and delivered.

But it is elsewhere that the heavy movement of 1925 is largely to be found; the number of cars loaded with L. C. L. merchandise increased by 2,250,000, or about 20 per cent, while the large group of manufactured products travelling under the item of "miscellaneous" increased by 3,200,000 cars, which was also about 20 per cent.

No brief survey such as this could adequately analyze such a trend as shown in Table II, but it must be emphasized that this great increase in the high grade and light loaded traffic on our railways is the result of several economic forces working jointly in the same direction: the marvelous development of the automotive and radio industries, which make large contributions to the movement of manufactured products by rail; the general increase in standards of living, which means that people are buying more things and of higher quality as well as greater quantity; the effect of adequate, prompt, and safe transportation service on the average manufacturer and merchant, who finds that he can do business with much reduced inventories and therefore buys and sells in smaller lots; the rapid development of refrigerator movement of grapes from California, citrus fruits and vegetables from Florida and California, and perishable products generally. All these factors mean a higher grade of living and a much more satisfactory service rendered by the railways, showing how they are doing their share in building up and maintaining our economic activities at a prosperous level.

Incidentally, this relatively greater increase in manufactured and L. C. L. traffic than in the commodity movements explains why the ton-miles in 1925 seemed to lag somewhat behind the carloadings. The question as to which method of measuring railway freight traffic is the more satisfactory—carloadings or ton-miles—depends for its answer on the point of view. The economist or business man studying the activity of the country, and its productivity, will lean to the carloadings as the better index. For the long-time record of railway performance, ton-miles are more often utilized. Both measures have their undoubted position in railway statistics.

New Facilities

The statistics of traffic state what the railways did in 1925, in the way of supplying that transportation service for which they were built and are operated. The next step in our analysis is to ascertain how they did it, that is, the facilities with which they worked, the personnel which carried on the operations, and the effectiveness with which those operations were conducted.

Turning first to the new facilities, we find that the program of capital improvements on which the railways were working during the year 1925 amounted to \$1,200,000,000 in money. Of this program, approximately \$775,000,000 was expended by the end of the year. The balance of \$425,000,000 has been brought over to be completed in 1926.

In one aspect, this was not a large capital program. It was less than in 1923 and 1924. But taken in connection with the large expenditures made during the past four years, the program for 1925 does not show badly by comparison.

The actual capital expenditures of the railways of Class I during the past four years have been as follows:

1922	\$429,000,000
1923	1,059,000,000
1924	875,000,000
1925	775,000,000
Total	\$3,138,000,000

This expenditure of more than \$3,000,000,000 during a period of four years, which is an average in excess of \$750,000,000 per year, offers one of the significant reasons why railway efficiency has been increasing. Any industry whose plant and machinery continues to improve, and is brought up to date with greater capacity or power, is made more adaptable to current needs, and is placed in better physical condition, can increase the effectiveness of its operations greatly. Such has been the story in the railway field. The equipment of the railroads has been improved and modernized. Their locomotives have been equipped with devices for more effective fuel consumption. Their freight cars are larger and stronger. Heavier rail and ballast have been laid. These things have meant fewer delays on the road, more effective utilization of power, greater mileage by every car and locomotive per day and per year, and a marked improvement in the efficiency and economy of conducting transportation. In addition, shops and shop machinery have been overhauled, terminal facilities have been improved and extended, and the problem of making the railway plant more nearly adequate to its functions in every way has been attacked.

Installations of locomotives and freight cars were on a somewhat lower scale during the first ten months of 1925 than during the corresponding period of 1924. The aggregates were 1492 locomotives in 1925 and 1770 in 1924—ten months for both years. Corresponding totals for freight cars for the ten months were 117,075 in 1925 and 129,451 in 1924. Retirements of both cars and locomotives were heavy during 1925, yet the total power of locomotives and capacity of cars increased.

The number of locomotives and cars on order at the close of the year was increased considerably by heavy buying during the last two months.

The Railway Personnel

The total number of railway employees of Class I in 1925 averaged about 1,770,000, compared with 1,777,000 in 1924. Table III gives the number on the payroll during each month of 1924 and the first ten months of 1925, with October partially estimated.

Aggregate compensation paid to all employees in 1925 amounted to \$2,900,000,000, which was in excess of 1924 by \$32,000,000, although the number of employees was

less by about 7,000. The answer to this seeming anomaly is to be found in the fact that the average compensation per employee was higher in 1925 than in 1924, the increase being about $1\frac{1}{2}$ per cent. The average annual earnings per employee in 1925 approximated \$1,638, whereas they averaged \$1,613 in 1924. This increase is due largely to increased earnings per hour by the various classes of employees. Although there were no general wage changes during the year, yet the average hourly, daily and yearly compensation of employees was on the upward trend. The classes that benefited most were the train and engine men, whose average hourly compensation was nearly 3 per cent greater than in 1924. The remaining general classes all showed smaller increases. As the number of hours of overtime work declined in 1925, both absolutely and relatively, the increase in average earnings per hour was not due to any increase in overtime labor.

TABLE III—TOTAL NUMBER OF EMPLOYEES—RAILWAYS OF CLASS I

Month	1924	1925
January	1,749,927	1,728,333
February	1,753,289	1,725,366
March	1,760,268	1,722,275
April	1,787,217	1,745,643
May	1,792,504	1,767,292
June	1,770,565	1,781,696
July	1,773,114	1,795,669
August	1,788,972	1,800,219
September	1,801,296	1,803,527
October	1,822,616	1,817,000
November	1,788,723	
December	1,736,699	

The reduction in amount of time put in by the employees at overtime or extra rates in 1925, compared with 1924, meant a gain to the railways in that less work was carried on under pressure, and more of it was done at standard instead of punitive rates. It meant also improved working conditions for the employee.

Reserve Equipment

One of the features of the year 1924 was the success of the railways in handling a large traffic with at all times a reserve fund of motive power and of freight cars. This situation was more strikingly true of the year 1925. There was a surplus of freight cars during every month of the year, the smallest number reported for any period up to December 1 being 104,000. In addition, there were at all times a considerable number of locomotives in storage. These locomotives, in good physical condition and often put up in white lead, represented a potential power to move trains which was a definite guarantee to the shipping public that the transportation situation was satisfactory. The smallest number of locomotives stored on any one date during 1925, up to December first, was 4,200.

This situation as to reserve equipment was so striking during the year, that Table IV summarizes it briefly as of the first of each month from January to December, showing the number of stored locomotives and the number of surplus freight cars on each of those dates.

TABLE IV—RESERVE EQUIPMENT

	Stored locomotives	Surplus freight cars
January 1	4,849	266,252
February 1	4,220	213,921
March 1	4,988	285,015
April 1	6,241	344,959
May 1	6,697	337,181
June 1	6,618	323,624
July 1	6,600	307,495
August 1	6,313	263,876
September 1	5,902	162,397
October 1	5,237	140,842
November 1	4,450	111,619
December 1	4,656	136,796

The figures of Table IV appear in graphic form in Charts E and G. Chart E compares the number of stored locomotives on each date in 1925 with the corresponding average for the same date of each of the four preceding years. Chart G makes the same kind of a comparison for surplus freight cars. The lines depicting the situation in 1925, in both these charts, run above the four or five-year average at all times, and on some dates far above.

Closely related to these charts are three others, D, F

and H, which show the physical condition of equipment in 1925, and also the freight car shortage. While these are not direct indications of reserve equipment, they do throw light on the general situation as to motive power and car condition and utilization.

Chart D shows the percentage of locomotives in serviceable condition during each month of 1925 to November, compared with the average month of the previous four years. Chart F is a similar showing for freight cars. Both charts indicate a better condition of locomotives and cars at all times in 1925, with an especially marked improvement in the case of locomotives. Again, the condition showed relative improvement for both classes of equipment toward the close of the year.

Chart H carries a remarkable story. It compares the number of cars representing the car shortage during each month of 1925 with the corresponding averages for the preceding five years. The line for 1925 here runs well below the five-year average, indicating the virtual disappearance of any shortage in 1925. In fact, on some dates no shortage whatever was reported, and the average for the year was negligible. A slight rise in the autumn, to be described later, is the only exception to the general rule for the year.

Operating Efficiency

Having considered the railway plant, the personnel, the new facilities, and the reserve and general condition of equipment, it is pertinent to inquire how the railways, with this improved plant, performed their task of handling a large freight traffic in 1925.

This inquiry deserves to be answered with a superlative, if any is to appear in this article. There seems little question in the minds of close observers of railway conditions in 1925, that the efficiency of transportation service reached a higher level than at any time in the previous history of the railways.

Here again, as I have already pointed out, the year should be considered not by itself, nor as a suddenly emerging phenomenon, but as the logical result of a gradually improving condition over a period of years. This condition was inaugurated and fostered by the definite program which the railways set for themselves at the beginning of 1923, and which they have consistently carried out for the last three years, often in the face of difficulties and always under pressure of heavy traffic conditions. But the program has been carried on, and the returns for 1925, indicating improved efficiency and economy in operation, are the best justification of the program and its purposes.

Let us consider the usual factors of so-called operating efficiency. The series of charts already referred to in a general way present a more impressive and cumulative picture of the efficiency situation than any language possibly could. With only one exception, which will be noted below, every factor showed a marked improvement in 1925, as compared with 1924 or with the average of the five preceding years.

The physical condition of locomotives and cars has already been discussed; also the large reserve of equipment on hand at all times during the year. Not only was the percentage of locomotives in serviceable condition higher than during the preceding five years on the average, but the number of locomotives awaiting repairs on the first day of each month was smaller than the five-year average. The year showed a consistent improvement also in the number and percentage of freight cars in serviceable condition, and as consistent a reduction in the number of freight cars awaiting repairs. In this connection, reference may again be made to Charts E to H.

Particular reference to Chart H, which clearly por-

trays the almost total disappearance of freight car shortage in 1925, has already been made. But a brief discussion of the shortage of less than 2,000 cars that developed during the months of September and October will serve to emphasize the fact that the only transportation tangles in 1925 were due to emergency conditions. All these conditions had been overcome, or were in process of being met, by the close of the year.

Only three of these tangles, or transportation difficulties, are worthy of mention. Such small shortages of cars as were recorded during the year were the results of abnormal conditions in three different sections of the country.

The sudden boom in real estate and building in Florida threw upon the lines serving that section an enormous demand for transportation of building material, in addition

to a large increase in passengers and in general freight. Because of difficulty in getting empties back through the Jacksonville gateway, some car shortage developed. The more serious results, however, were found in car accumulations that occurred as the result of embargoes against shipments to Florida points. The accumulation of cars because of "connections unable to accept" rose from 100 in July to 6,400 a week in October. Ocean carriage relieved the situation in part, additional railway and bridge facilities are being provided, and the establishment of a Florida unit of the Southeastern Shippers' Advisory Board in connection with a permit system was also of great assistance.

The anthracite coal strike on September first made increased demands on the high grade non-union bituminous mines of Kentucky, resulting in some short-

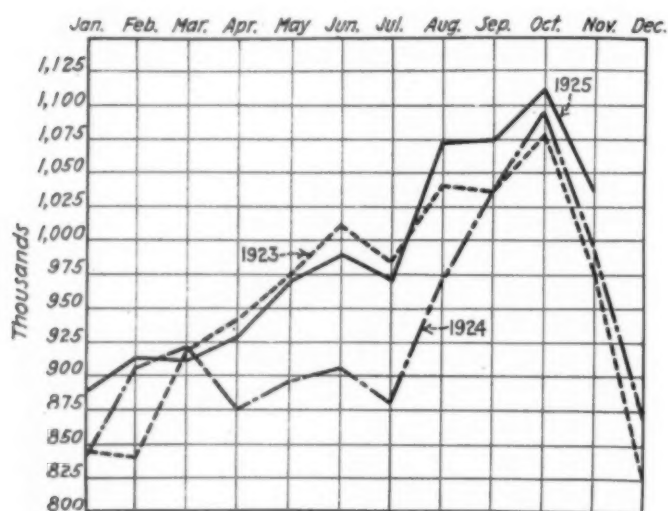


Chart A—Average Weekly Carloadings, By Months, All Commodities
(Years 1923, 1924 and 1925)

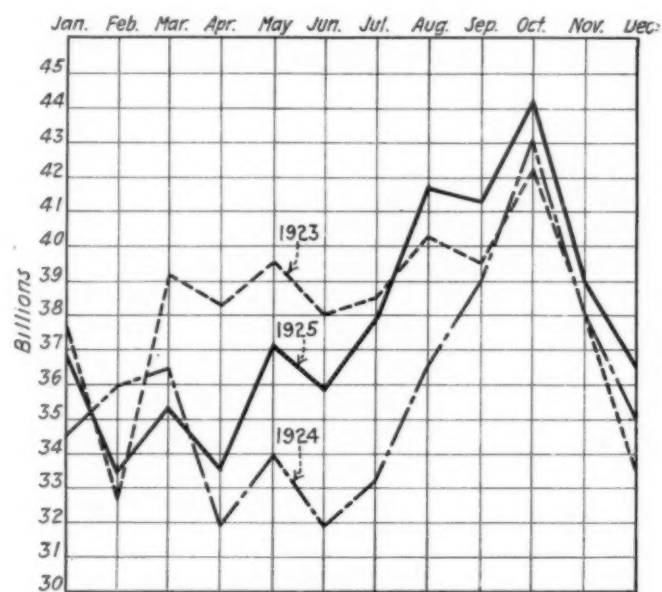


Chart B—Net Ton-miles By Months—1923, 1924, 1925
(November and December Estimated)

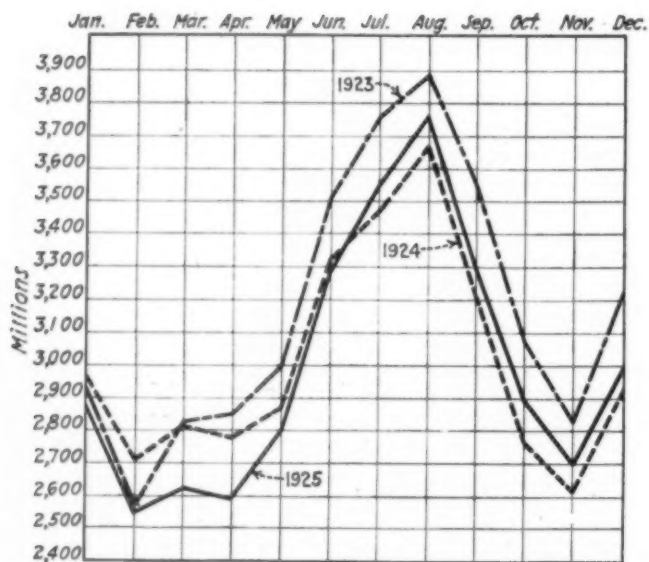


Chart C—Revenue Passenger-miles, By Months
(Years 1923, 1924 and 1925)

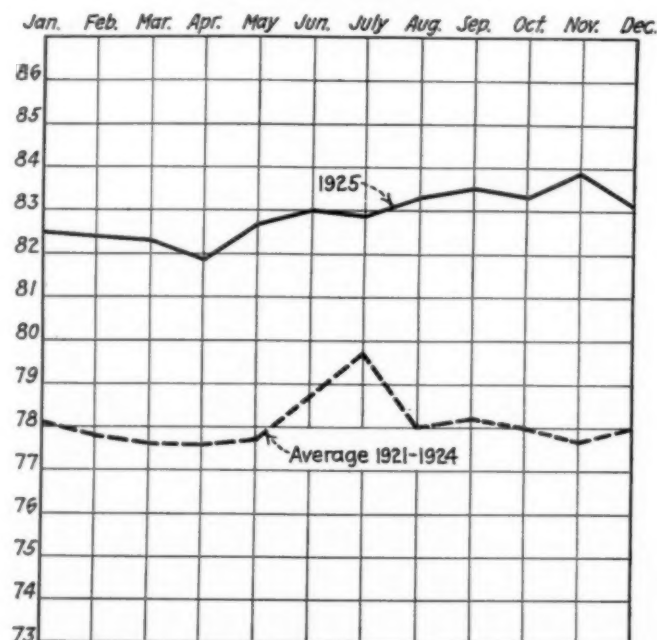


Chart D—Percentage of Locomotives in Serviceable Condition, By Months
(4-year average 1921-1924, and year 1925)

age of coal cars and also congesting the narrow gateway at Cincinnati through which coal largely passes to the west. This tied up the movement and delayed the return of empties, and the shortage of coal cars rose from none in July to as high as a daily average of 1,172 in the first week of September. This was reduced to about 400 by the end of November, through the transfer of cars from other sections.

The shortage of refrigerator cars which rose from zero in the spring and summer to a daily average of 2,298 in the first week of November, was the result of the holding back by growers and buyers of the California grape crop early in the season, followed by very heavy movement in October. Owing to sudden rains and a fear of injury, 800 to 900 cars per day were offered the carriers, and for a time caught the originating lines short of these cars on

the spot, although there were plenty elsewhere. A total of 72,500 cars of grapes were handled during the 1925 season, which was far in excess of any prior year.

So much for the transportation difficulties experienced in 1925, all of which were local and due to economic conditions.

The important efficiency factor of miles per freight car per day, as set forth in Chart I was higher in every month of 1925 than during the average of the preceding five years. The average for the ten months to October 31 was 28.1 miles, compared with 26.8 miles for the corresponding period of 1924. It may be added that the average attained in October, namely, 32.2 miles, was the highest for any month on record. In this connection, it is well to recall that this average of miles per car-day is computed by dividing the total of freight car-miles by all

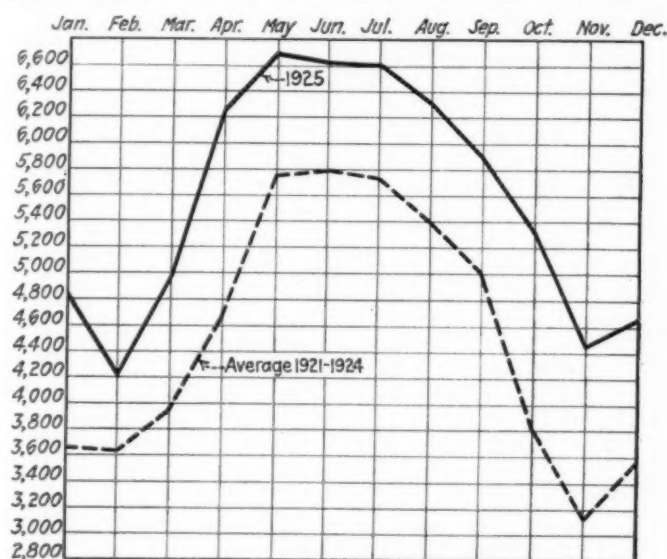


Chart E—Stored Serviceable Locomotives, By Months
(4-year average 1921-1924, and year 1925)

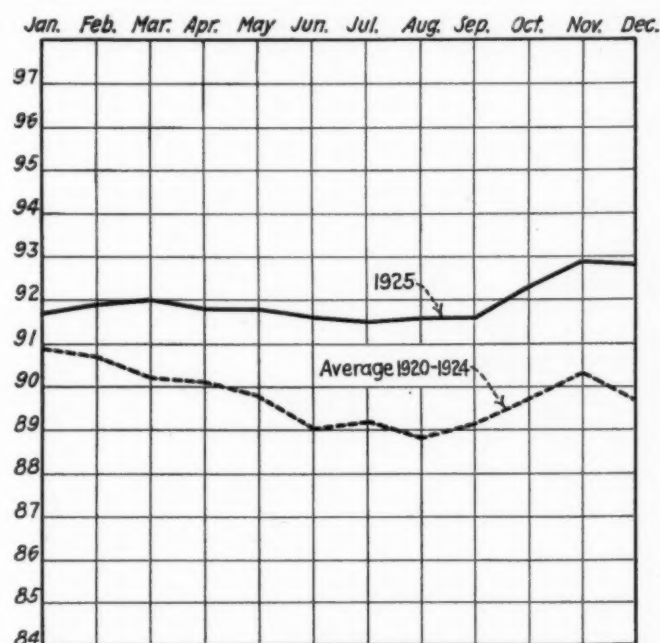


Chart F—Percentage of Freight Cars in Serviceable Condition, By Months
(5-year average 1920-1924, and year 1925)

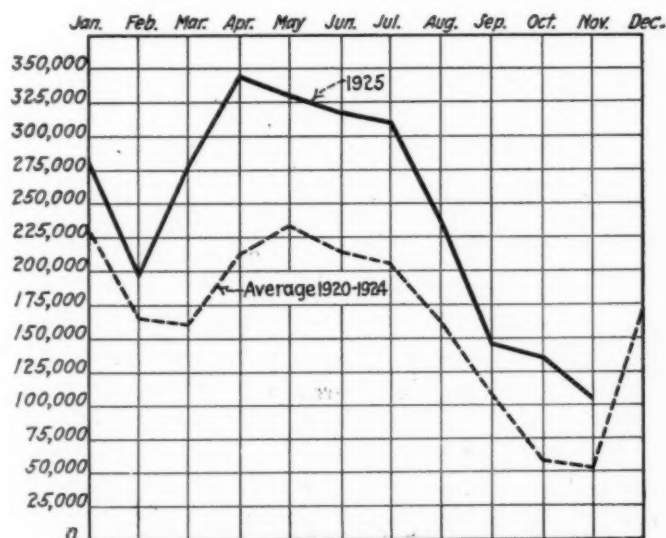


Chart G—Average Daily Freight Car Surplus, By Months
(5-year average 1920-1924, and year 1925)

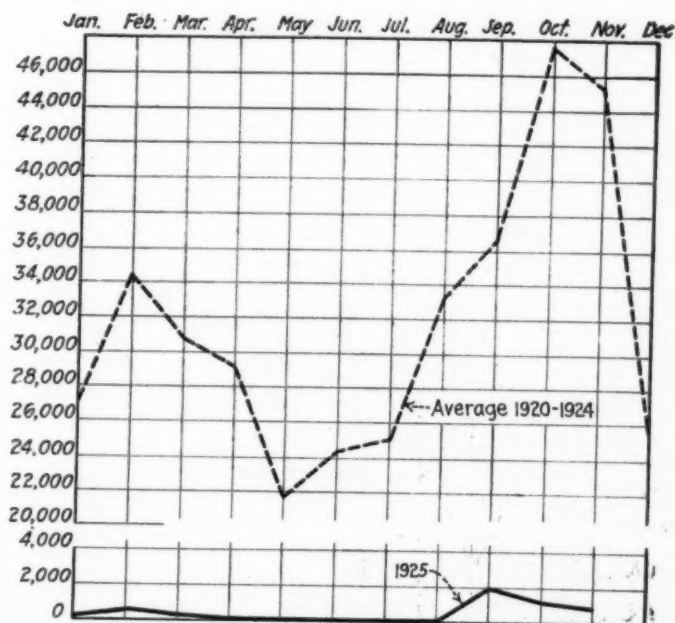


Chart H—Average Daily Freight Car Shortage, By Months
(5-year average 1920-1924, and year 1925)

freight cars, including those idle or surplus, those in shop for repairs, and those in the hands of shippers for loading or unloading. It is not an average movement of cars while in motion, but merely represents the average miles made each calendar day by all cars in railway service at the time. In the effort to place this average on a more equitable basis, I recomputed the average last year by omitting from consideration the surplus cars and the cars undergoing repair. This restricts the average to what may be called the active cars. On this revised basis, when applied to the mileage made in 1925, the movement per active car per day during the first ten months averaged 34.4 miles, compared with 32.4 miles for the corresponding ten months of 1924; while the average attained in October was 36.8 miles.

Closely related to the average movement per freight

car day is the average daily movement of the locomotive. The number of miles per locomotive day, during the first ten months of 1925, averaged 57.5, compared with an average of 55.0 miles for the corresponding period of the preceding year. This was an increase of nearly 5 per cent, but was lower by about the same percentage than during the corresponding period of 1923.

In considering the fact that the locomotive miles per day were less in 1925 than in 1923, allowance must be made for the large number of locomotives stored in serviceable condition in 1925. The average is computed by including all locomotives in the service of the railways, whether stored, whether under repair, or whether in actual use. It is therefore subject to the same drawback as the average of freight car miles per day, which I have already discussed, and which I endeavored to correct by a recom-

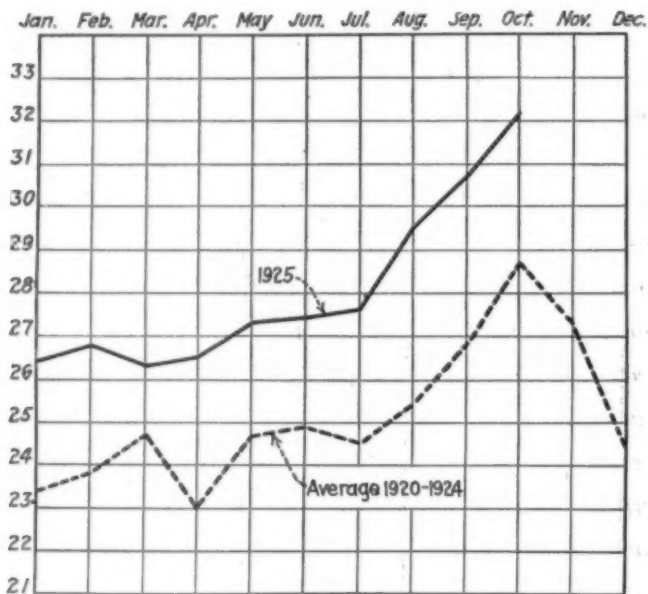


Chart I—Miles per Freight Car Per Day, By Months
(5-year average 1920-1924, and year 1925)

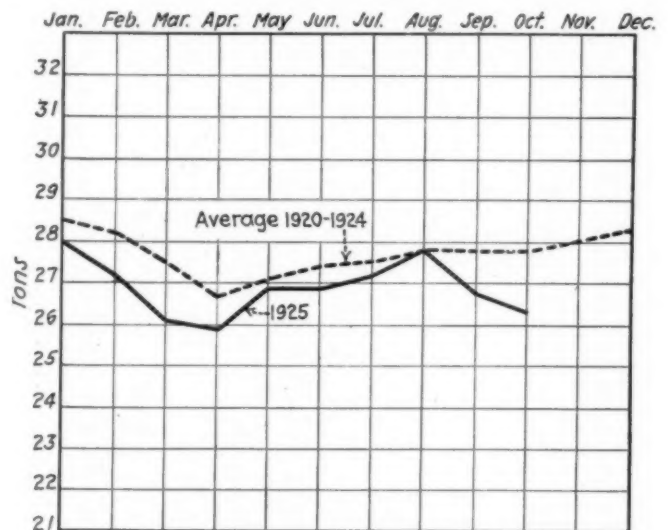


Chart J—Average Load per Car, By Months
(5-year average 1920-1924, and year 1925)

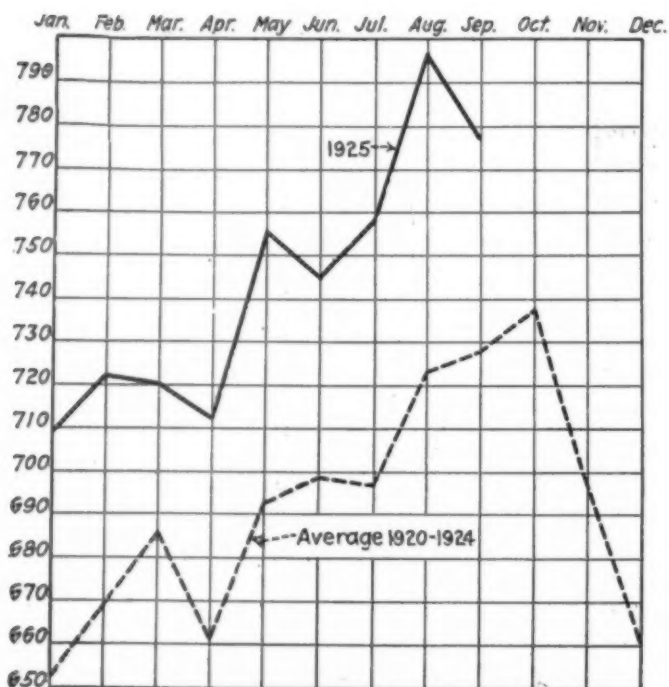


Chart K—Net Tons per Train, By Months
(5-year average 1920-1924, and year 1925)

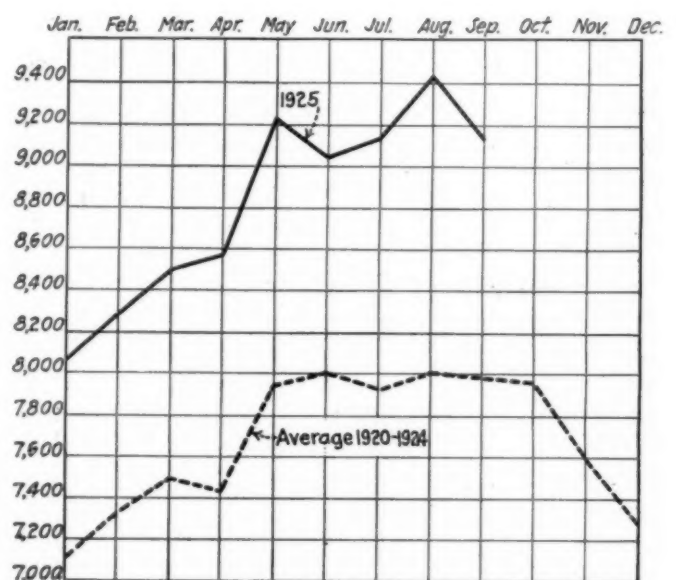


Chart L—Net Ton-miles per Train-hour, By Months
(5-year average 1920-1924, and year 1925)

putation which excluded surplus cars and cars under repair. A similar correction of the average number of locomotive miles per day would exclude stored locomotives and locomotives under repair, and would place the year 1925 in a relatively more favorable light with respect to 1923.

The net tons per train (Chart K) showed an almost consistent increase during each month in 1925, reaching a peak of nearly 800 tons in August. This was the highest average for any month on record. The monthly average in 1925 was at all times higher than during the preceding five years. This performance was especially noteworthy in the face of the inability of the railways to make any great improvement in average carload. The average load per freight car, for the first ten months of 1925, was 26.9 tons, compared with the same average in 1924, 29.3 tons in 1920, 27.6 tons in 1921, and 27.9 tons in 1923. Chart J shows that the average load per car in 1925 was below the five-year average during virtually every month in the year, and was the only exception to the general rule of increased efficiency during 1925.

This question of average loading is closely related to that of the greater proportion of L. C. L. and manufactured products in the total traffic, already developed at some length. Coal and some of the other heavy-loading commodities are occupying a smaller place in the traffic situation, while the lighter-loading products are growing in importance. Again, the shipper has considerable responsibility in this matter, and he sometimes finds it less needful to load to the maximum when cars are plentiful and he thinks he can get another empty car at any time on demand. To him there is no loss, and perhaps even an advantage, if he utilizes three cars for a series of shipments, although they could have been packed into two cars; to the railroad there is little or no gain, if three cars must be supplied instead of two, with the cost of additional handling, mileage, and other expenditures attendant on car movement.

Again, it must be recalled that the railways are increasing the average capacity of their freight car equipment. On November first it stood at 44.7 tons, compared with 44.3 tons at the end of 1924, and 42.4 tons in 1920. Such an increase in car capacity should be accompanied by at least an equal increase in tons of load per car. The recent tendency has been in the opposite direction.

Another of the so-called efficiency factors, which takes into account both the average carload and the average distance travelled by a freight car per day, is stated in terms of net ton-miles per freight car day. This average, for the first ten months of 1925, was 489, which was greater than during the corresponding period of 1924 by 19, or about 4 per cent. It was, however, lower than during the corresponding period of 1923 by 28 miles, or nearly 6 per cent. This factor is, of course, affected by the almost stationary or declining average load per car, to which reference has just been made.

Chart L is an impressive showing of effective train operation. It represents the average number of net ton-miles performed per freight train-hour. Each and every month of 1925 was consistently higher than the average month of the previous five years.

The showing is so impressive that the figures in detail are set out in Table V. In this table averages are included for each month of 1925 to October, for each month of 1924, and for the average month of the five-year period.

This factor of net ton-miles per train-hour has in it several elements of effective operation. To attain a high figure, it is necessary that a freight train should be heavily loaded, and also that it should be able to move from originating point to destination with a minimum of delay and a maximum of effective motion. Both of these elements

were present in a marked degree during the year 1925. Chart K indicates the extent to which the average load per train was increased during the year 1925 to record levels. The average freight train speed during the first ten months of 1925 was 11.8 miles, compared with 11.5 miles during the same months of 1924. While this improvement does not appear great, it was an appreciable advance toward a more consistent movement on the part of freight trains. This increase in average speed is not the result of any great increase in speed at which a train travels while in motion, but is largely the result of eliminating or reducing the time lost through delays in intermediate yards, on passing tracks, and the like.

TABLE V—NET TON-MILES PER TRAIN-HOUR

Month	1925	1924	1920-1924 (average)
January	8,066	7,342	7,105
February	8,299	7,794	7,328
March	8,505	7,953	7,491
April	8,573	7,937	7,429
May	9,226	8,316	7,939
June	9,041	8,408	8,001
July	9,139	8,380	7,927
August	9,426	8,733	8,004
September	9,128	8,743	7,985
October	8,826	8,790	7,966
November	8,537	8,537	7,597
December		7,806	7,271

The real achievement of the railways in 1925, in connection with the high average of net ton-miles per train hour attained, may be realized from the fact that in each of the five months from May to September, inclusive, the average surpassed nine thousand, and rose as high as 9,426 in August. Never before had the average been above 8,790. The peak for 1925 was therefore higher than the peak of any previous year by 636 ton-miles, or more than 7 per cent. Every month of 1925 showed an improvement over the corresponding month of 1924, the greatest relative increase being that for the month of May, when the increase over 1924 was 910 ton-miles per train-hour, or nearly 11 per cent. The average for the first ten months of 1925 was 8,822 ton-miles, compared with 8,232 ton-miles during the same period of 1924, which was an increase of about 7 per cent.

These were the more striking of the efficiency accomplishments of the railways in 1925, but there were a number of additional factors in which the year excelled, and to which reference should be made, although briefly.

In the matter of the effective utilization of locomotive fuel, the results for 1925 were the best on record. There has been an almost consistent reduction since 1920 in the number of pounds of fuel consumed per physical unit of performance, both in the freight and in the passenger service, and the reduction was continued at an appreciable pace in 1925. Table VI gives the number of pounds per 1,000 gross ton-miles (including locomotive and tender) in the freight service, for each month of 1925 to October, and for all the months of 1923 and 1924.

TABLE VI—LOCOMOTIVE FUEL CONSUMPTION IN FREIGHT SERVICE (POUNDS PER 1,000 G. T. M., INC., L. AND T.)

Month	1925	1924	1923
January	164	179	186
February	155	170	194
March	148	162	179
April	138	151	165
May	132	143	154
June	127	135	146
July	126	134	143
August	125	131	144
September	128	136	146
October	138	138	153
November	...	149	160
December	...	166	165

It will be noted that the average consumption for each month of 1925 declined under the corresponding averages for the same months of 1923 and 1924. Some of the reduction were noteworthy. In January and February, for example, the reduction was 15 pounds per 1,000 gross ton-miles, or between 8 and 9 per cent. Even in October, when the average appears to be the same for 1924 and

1925, there was a slight difference of a fraction of a pound in favor of 1925. The average reduction for the ten months to October 31 was 10 pounds, or 7 per cent, compared with the corresponding period of 1924, and nearly 14 per cent compared with the same period of 1923.

No statistical table is presented here with respect to the reduction in locomotive fuel consumption in the passenger service, but improvement occurred also in that field. Comparing the first ten months of the year, the average amount of fuel consumed per passenger train car-mile was 16.0 pounds in 1925, as against 16.8 pounds in 1924 and 18.1 pounds in 1923. The relative reduction from 1924 to 1925 was 5 per cent, and nearly 12 per cent from 1923 to 1925.

Still other fields of improvement in 1925 were those of loss and damage and probably demurrage.

Loss and damage payments in the freight service were reduced more than 20 per cent during the first six months of 1925. This reduction, which was the result of a continuous campaign on the part of the railways, collectively and individually, followed consistent reductions each year since the peak in 1920, when the payments approached close to \$120,000,000. In 1925, the total was brought below \$40,000,000 for the first time since the rise in prices resulting from wartime conditions.

Demurrage payments were also probably reduced in 1925, although figures for the year are not in hand as this article is prepared. But the faster movement of freight cars indicates helpful co-operation from the shippers, who have held the freight cars for shorter periods and have saved themselves demurrage charges and the railways much trouble by releasing cars within free time.

Financial Results in 1925

The railways of Class I earned an operating revenue of \$6,170,000,000 in 1925, compared with \$5,986,000,000 in 1924. There was thus an increase of \$184,000,000, or approximately 3 per cent, over 1924. Even so, the total operating revenues in 1925 were less than they were either in 1920 or 1923. This was largely due to the fact that the passenger revenues fell off, while the freight revenues were less than in 1923, although the carloadings were greater.

Total operating expenses in 1925 were slightly greater than in 1924. They amounted to \$4,575,000,000 in 1925, which was an increase of a small fraction of one per cent over the preceding year. The ability of the railways to handle an enlarged traffic that brought in more money by \$184,000,000, and do the additional business with almost no increase in expenses, is what largely spelled the improvement in financial condition in 1925.

The operating ratio, which really tells the story of effective financial results, was 74 per cent in 1925, compared with 76.14 per cent in 1924, and 77.75 per cent in 1923. This is another indication of continual improvement year by year, from 1922 to 1923, from 1923 to 1924, and from 1924 to 1925. Even if the improvement is not great in any one year, the cumulative effect of such improvement year after year eventually brings results.

Railway taxes again broke all records. This is another place where the use of a superlative may be justified, although it is a superlative which runs in the wrong direction. The taxes paid by railways of Class I in 1925 were about \$360,000,000, which was so close to that million dollars a day which has been recently talked about that it has practically become a reality. Having passed the midway mark between \$300,000,000 and \$400,000,000, the railways are now approaching the latter and larger figure, which will be reached unless some way is found to check the rising tide of heavy governmental expenditures in the states, municipalities, and other local subdivisions.

The taxes paid by the railways in 1925 again exceeded the cash dividends declared by them, this being the fourth successive year in which such was the case.

The net railway operating income for 1925 the item which is compared with the property value in order to arrive at the rate of return, was \$1,130,000,000. This was greater by \$143,000,000, or 14.5 per cent, than in 1924. It was greater also than in any previous year, the next highest amount earned by railways of Class I in the form of net operating income being that of the calendar year 1916, when the aggregate was \$1,040,000,000.

In considering this increase in net income, we should also consider the increase in the railway investment and value which helped to bring it about. Perhaps the most conclusive way of showing that a net income of \$1,130,000,000 in 1925 was relatively less than the smaller figure of \$1,040,000,000 in 1916 is to cite the rate of return on property investment in each of the two years: 5.90 per cent in 1916 and only 4.80 per cent in 1925. The larger net income of the later year thus produced a much smaller rate of return. This is because the property investment of the carriers showed a net increase of one-third between 1916 and 1925. The basic figures on which these rates of return were computed, being the road and equipment account, cash, and materials and supplies, were \$23,548,000,000 at the beginning of 1925, compared with \$17,636,000,000 in 1916. The increase from 1916 to 1925 was \$5,912,000,000, or 33 per cent. This large input of new capital during the period produced a comparatively small increase in net operating income as between the two years.

There is no comparison of 1925 with 1916 on a valuation basis, because the tentative valuation made by the Interstate Commerce Commission in 1920 is not available for 1916. But we do know that the rate of return earned by the railways in 1925, on the basis of the 1920 tentative valuation, brought down to the beginning of 1925 by adding the net increase in additions and betterments, was approximately 5.60 per cent.

Even with the large traffic in 1925, the high level of operating economy and efficiency, and the record net operating income, the railways as a whole did not reach the 5¾ per cent of "fair return" on their property valuation as fixed by the Interstate Commerce Commission.

Table VII is a brief statement of the revenues, expenses, taxes, and net operating income of the railways, stated in millions of dollars, for the year 1925, compared with 1924 and 1923.

TABLE VII—CONDENSED INCOME ACCOUNT

	1925 (millions)	1924 (millions)	1923 (millions)
Total operating revenues.....	\$6,170	\$5,986	\$6,360
Total operating expenses.....	4,575	4,558	4,945
Taxes	360	344	337
Net operating income.....	1,130	987	984
Return on property investment.....	4.80%	4.33%	4.48%

Operating Revenues

The freight revenue for the year 1925 amounted to \$4,547,000,000, which was an increase of \$199,000,000, or 4.6 per cent, over 1924. This increase fairly well measures the increased service rendered to the freight shipping public, especially in view of the fact, later to be developed, that the average revenue per ton-mile was slightly less in 1925 than during the preceding year. The total ton-miles, it will be recalled, increased 5½ per cent over 1924.

The passenger revenue showed a decline of \$31,000,000 under 1924 and \$102,000,000 as compared with 1923. The total amount for 1925 was \$1,045,000,000, as compared with \$1,076,000,000 for 1924, and \$1,147,000,000 in 1923. This progressive reduction in passenger revenue followed the progressively declining passenger business.

Other revenues rose and fell according to the prevailing conditions involved. The revenues received from the carriage of mail and express were almost the same as in 1924. Table VIII is a statement of the various items of operating revenue, covering the years 1923, 1924 and 1925.

TABLE VIII

	1925 (millions)	1924 (millions)	1923 (millions)
Freight revenue	\$4,547	\$4,348	\$4,626
Passenger revenue	1,045	1,076	1,147
Mail revenue	98	98	93
Express revenue	145	144	153
All other revenues	335	320	341
Total	\$6,170	\$5,986	\$6,360

Operating Expenses

The total cost of operating the railways of Class I in 1925 was \$4,575,000,000. This was an increase over 1924 of \$17,000,000, or approximately 0.4 of 1 per cent. This slight increase in 1925 is wholly explainable by the increase in freight traffic during the year. Even though greater than in 1924, the total operating expenses in 1925 were less than in 1920, 1921 and 1923. In fact, operating expenses between 1920 and 1925 were reduced by the astounding figure of \$1,255,000,000, despite a somewhat greater freight traffic in 1925 than in 1920. More than half of this item was passed on to the shipping public, and thus to the great consuming public of the United States, in the form of reduced freight rates. It has been estimated, and with a fair degree of accuracy, that between the beginning of 1921 and the end of 1925 the average receipts per ton-mile declined from 1.275 cents of 1.094 cents. This is a reduction of nearly 15 per cent. Compared with the freight rates placed in effect in 1920, the freight traffic actually handled in 1925 at the lower rates then prevailing, represented a saving to shippers of nearly \$800,000,000. In other words, that is the amount by which the freight charges for 1925 would have been greater than they were, had the average receipts per ton-mile suffered no reduction since the beginning of 1921.

It is true that receipts per ton-mile do not indicate with exact accuracy the level of freight rates, but it is the best available basis for comparison. In view of the fact that the percentage of high grade commodities in the total freight traffic has been growing, any error in this comparison would seem to run to the disadvantage of the railways. That is, if it were possible to compare freight rate levels in 1925 with those of 1920, on an even basis throughout and with no change in the character of the traffic, the reduction in rates would doubtless be found to average more than 15 per cent.

Of the various important items in the operating expense account in 1925, the most significant is, of course, the item of wage payments. Total compensation to employees increased in 1925 by \$32,000,000, or approximately 1.1 per cent. The ratio of this compensation to total operating expenses increased slightly in 1925, from 58 per cent in 1924 to approximately 59 per cent in 1925.

As to the other large items of expense, additional savings were made in 1925 on top of those already experienced in 1924, because of the more efficient use of fuel. As a result of the reduced consumption of locomotive fuel in both freight and passenger service, there was a total saving in fuel for the year approximating 7,000,000 tons in the two services combined. This does not include the switching service. At the prevailing price of coal in 1925, which was somewhat lower than for 1924, this item of saving through more efficient consumption alone, represented an economy in dollars and cents in excess of \$18,400,000. In addition, the generally lower cost of all the coal purchased and consumed during the year had a wholesome effect on the expense account.

Other prices showed some tendency to rise, but on the

whole the price levels did not change greatly as between the two years.

Table IX presents the various items of operating expenses in 1925, compared with 1924 and 1923. As between 1924 and 1925, it will be noted that there were increases in the maintenance of way account, the traffic account, and the general account, while maintenance of equipment and transportation expenses declined. The reduction in transportation costs was \$21,000,000, or about one per cent. In the light of heavier payments to trainmen, and the greater traffic handled, this was a real achievement. The fuel savings are reflected in this account.

TABLE IX

	1925 (millions)	1924 (millions)	1923 (millions)
Maintenance of way	\$825	\$802	\$822
Maintenance of equipment	1,267	1,270	1,474
Traffic	106	99	94
Transportation	2,160	2,181	2,352
General and other	217	206	203
Total	\$4,575	\$4,558	\$4,945

Net Operating Income

The net operating income for the year 1925, as already stated, was \$1,130,000,000, which was an increase of \$143,000,000, or 14.5 per cent, over 1924. I have pointed out that this increase in net operating income was produced largely by keeping expenses down while revenues were showing an increase. This in turn is an indication of efficient and economical management.

Table X indicates how the rate of return on property investment (including cash, materials and supplies) was cumulated by months during the years 1923, 1924 and 1925.

TABLE X

	Rate of return (annual basis) per cent		
	1925	1924	1923
1 Month	4.76	3.79	4.69
2 Months	4.75	4.62	3.92
3 Months	4.47	4.61	4.35
4 Months	4.38	4.45	4.67
5 Months	4.38	4.27	4.87
6 Months	4.45	4.12	4.89
7 Months	4.53	4.06	4.81
8 Months	4.65	4.08	4.76
9 Months	4.77	4.20	4.64
10 Months	4.83	4.29	4.58
11 Months	4.81	4.30	4.54
12 Months	4.80	4.33	4.48

Receipts Per Traffic Unit

The average receipts per ton-mile in 1925 approximated 1.094 cents, compared with 1.116 cents in 1924. This was a reduction of 0.022 cent, or almost exactly 2 per cent. The average for 1924 was in turn some 13 per cent lower than the corresponding figure for 1921, following the rate increases of 1920. This makes the average for 1925 about 15 per cent below that for 1921.

The average receipts per passenger-mile for 1925 were 2.92 cents, compared with 2.978 cents in 1924, which indicates a reduction of about 2 per cent from 1924 to 1925. There has been a progressive reduction since 1921, each year being slightly lower than the next preceding year, making the total reduction between 1921 and 1925 approximately five per cent.

Summary

Let me repeat the warning which I expressed in my review article last year, to the effect that too much enthusiasm should not be engendered with respect to railway results in 1925. That the operating performance was excellent is beyond all question. That in many respects the railways surpassed all their previous records, and exceeded even the highest expectations, is also true. But this is not to say that they have arrived at the possible limits of efficient and economic operation. No industry becomes 100 per cent perfect in three years, nor does any industry that

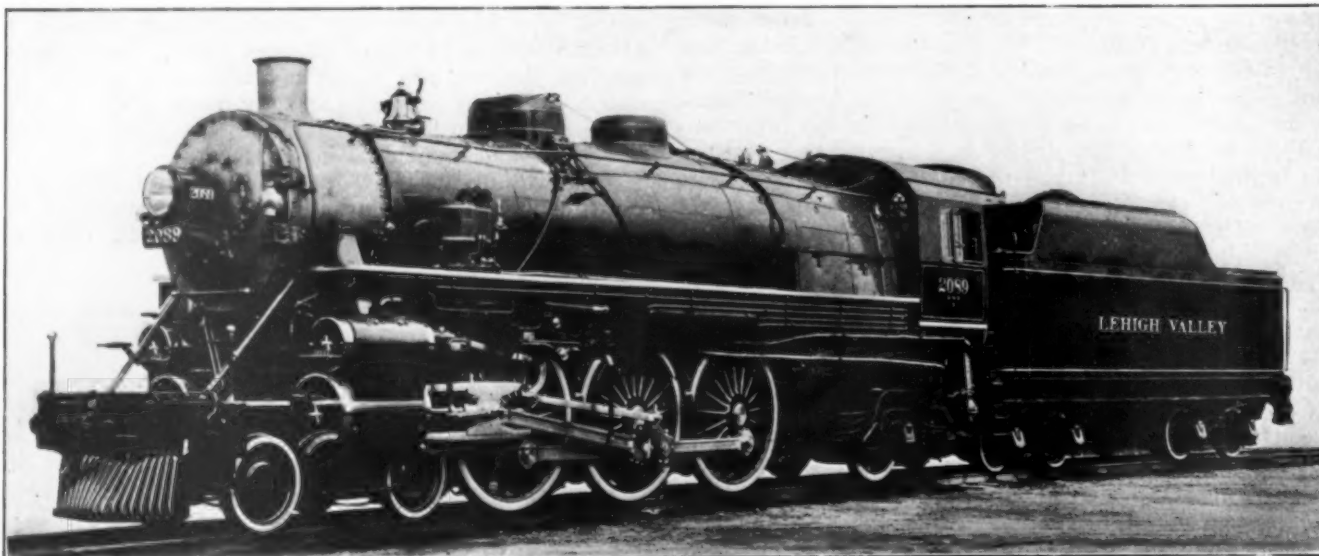
claims perfection deserve to continue in the favor of its own eyes or in the eyes of the public. Much has been done, but much remains to be done, both by the railways themselves and by the public in the shape of further co-operation.

The same steady and consistent progress toward higher levels of operating efficiency and economy should continue in the future as in the past, and should bear fruitful returns. Even with a possible recession in freight traffic during 1926, the coming year may well take its place as another forward step in the development of a highly efficient and well coordinated transportation machine, ready to serve every economic need of the people.

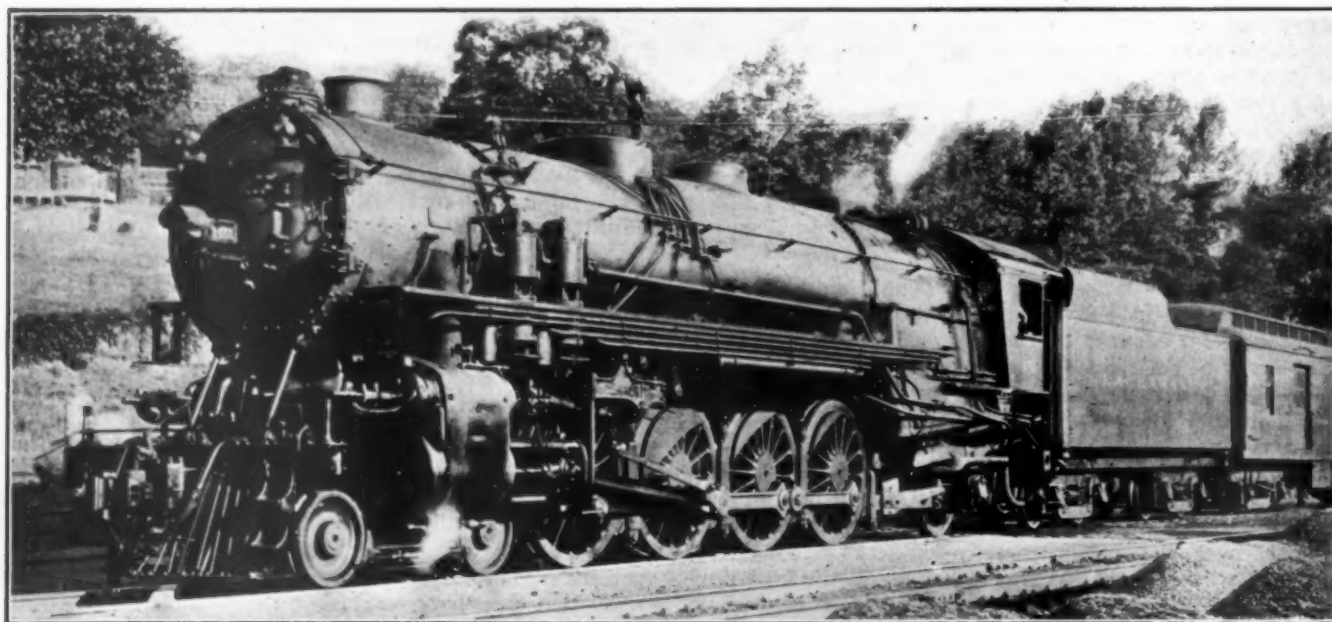
Problems are ahead, of course. Rate and wage readjustment talk is in the air. Rate changes upward and downward are under actual discussion. New railway legislation will undoubtedly come before Congress, which may lead to a period of uncertainty. Valuation and consolidation offer many open questions for consideration and future settlement. The railway problem will never be

fully solved, but will always be in process of discussion and experimentation. Yet even that problem can be minimized, and a satisfactory solution can be approximated, if it is kept out of the realm of politics, and is handled as the economic question which it is.

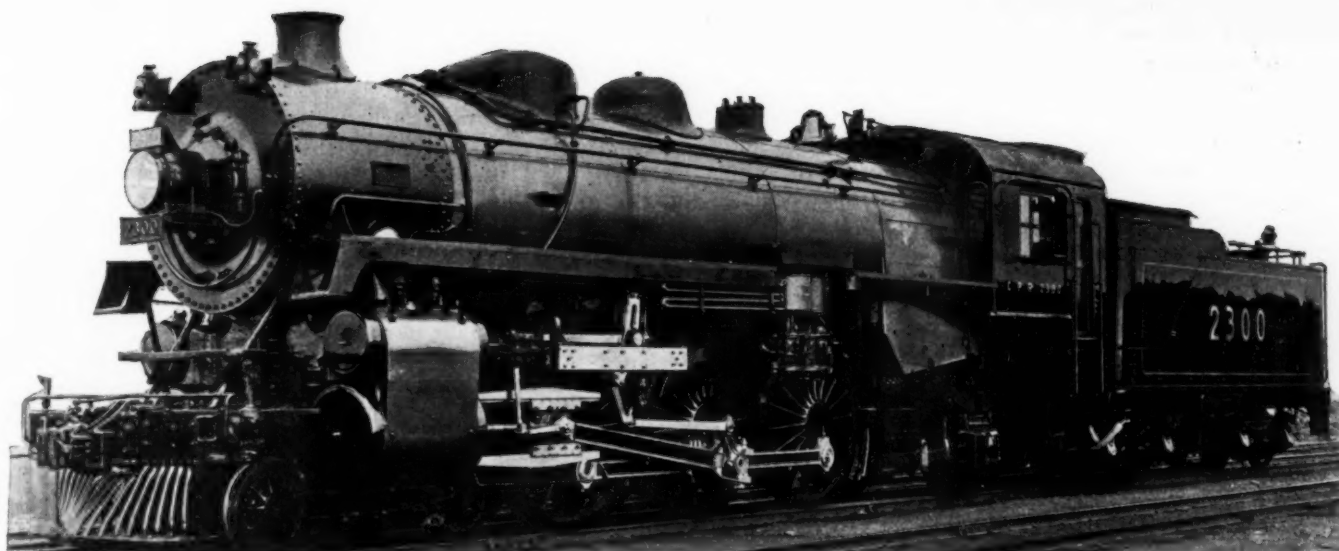
It is necessary also, in closing, to repeat the same note of disappointment as in 1924, to the effect that with heavy traffic well distributed throughout the year, a high grade of operating efficiency, and a very marked increase in economy of operation, the railways were not able in 1925 to earn even the rate of $5\frac{3}{4}$ per cent as a "fair return" on the tentative valuation of their properties as fixed by the Interstate Commerce Commission. Not until they reach and surpass that figure can it be truthfully said that the Transportation Act has fully justified itself. In fact, they should not merely reach it; they should be able to average it over a period of years, so that the phrase "as nearly as may be" in the act shall not be a meaningless set of words, but the expression of a definite legislative purpose carried to accomplishment.



A Resplendent Lehigh Valley Pacific



D. L. & W. Three-Cylinder Mountain Type Locomotive at Paterson, N. J.



A Modern C. P. R. Locomotive

Canada Far Ahead of Last Year

*Roads earning record net with prospects good for 1926—
Hopeful about immigration*

By James G. Lyne

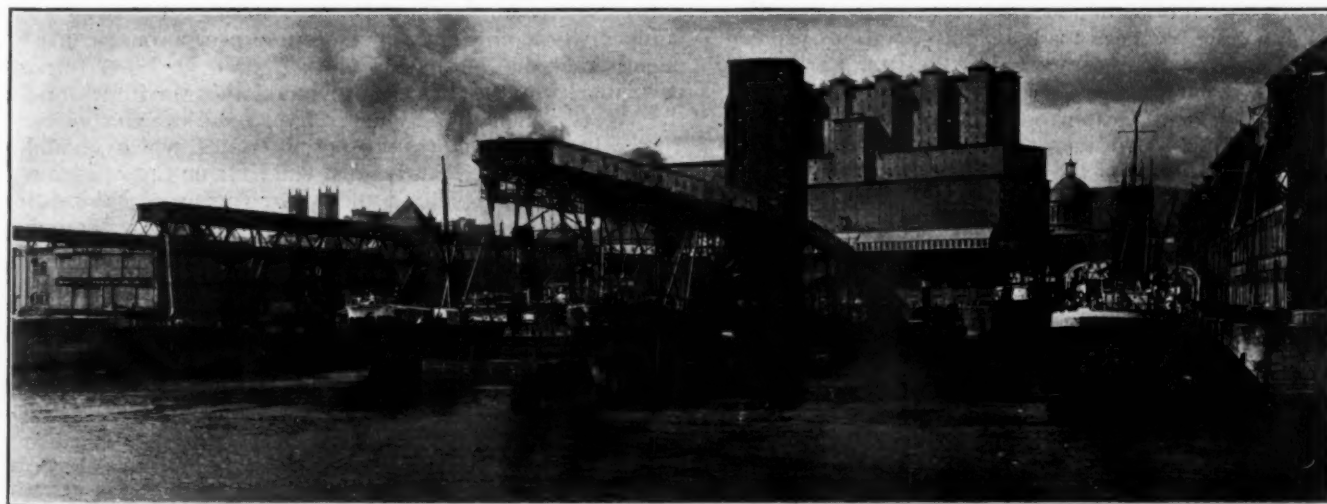
THE year 1925 did not begin auspiciously for the Canadian railroads. The wheat crop of the previous year was not large and traffic in the early months of the year, in fact up until the 1925 crop began to move, ran under that of 1924. But 1925's harvest was good and has brought greatly improved traffic during the last few months. What is more, prices have held well, which means, probably, that improved conditions among the farmers will keep general business good during the coming year. The outlook, then, is bright.

The railroads, however, did not feel the full brunt of the great decline in traffic—and consequently gross earnings—during the early part of the year, since they have

been able so to increase their efficiency that, in spite of declines in gross, they were able to increase their net earnings. The following table shows the earnings of the two principal roads for the first ten months of the current year:

		TEN MONTHS			
		Gross		Net	
		1925	1924	1925	1924
Canadian Pacific.....		\$144,243,276	\$148,711,039	\$29,079,949	\$27,468,059
Canadian National....		\$196,444,081	\$195,325,323	\$20,485,721	\$10,769,664

The Canadian Pacific's net for the ten months is the best since 1917 and the Canadian National expects to have a net by the end of the year of about \$30,000,000—the best it has earned since its properties were consolidated.

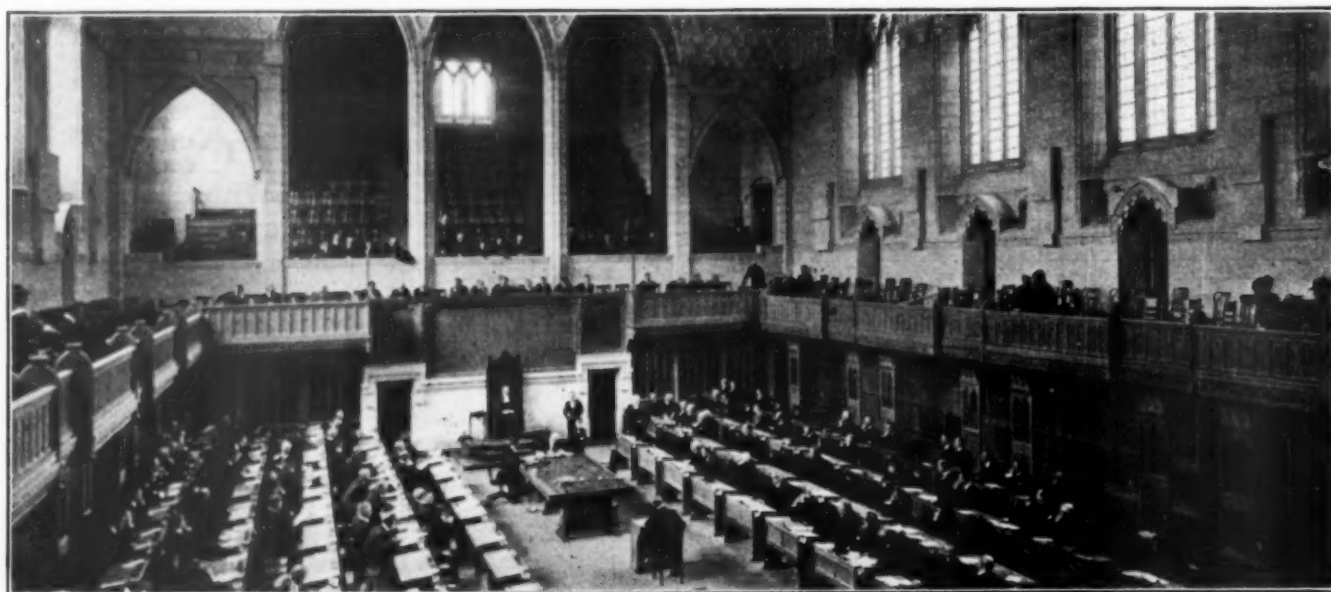


In Montreal Harbor

The latter system still fails by millions to pay fixed charges and will likely continue to do so as long as every failure present and past to meet interest is charged against it by the government as an additional sum on which the road is expected to earn a return. If the road were a private property it would long ago have been in the courts and back interest payments would of necessity have been removed from the records. In addition to the peculiar accounting in this connection is the fact that the road is required to keep in operation many lines which no private company would keep unless granted a subsidy. The Canadian National has no subsidy account. Naturally, nobody is getting something for nothing; the Canadian people are paying the bill. The only result is that comparison of Canadian National figures with those of other roads has so many buts and ifs attached to it that the task is made unnecessarily difficult and it is of very little value. However, there need be no question but that C. N. R. figures may easily be compared with the same figures in previous years—and an improvement in net of

A large body of agrarian opinion in the Prairie provinces, however, which was not without a political voice, insisted upon the retention of the Crow's Nest rates intact and, moreover, their extension to the Canadian National as well. The law which Parliament passed, therefore, was a compromise. The Board of Railway Commissioners was instructed to proceed with a general investigation into the rate structure of the Dominion and to overhaul it as necessary—*except* that rates, on grain and flour only, on all lines west of Fort William and Port Arthur should not exceed the Crow's Nest rates.

Commodities moving westward from the Prairie provinces to the Pacific have in the past borne higher rates as a compensation for the mountainous character of the country and the consequent higher costs of construction and operation. In September, however, the Railway Board issued an order fixing rates on Pacific-bound grain at the same level, mileage considered, as those on similar traffic eastbound. There was considerable dissension over this order among the members of the board itself, dis-



The House of Commons at Ottawa

90 per cent over the first ten months of 1924 shows encouraging progress toward better days.

The Rate Situation

The freight rate situation still remains to be settled, although a start has been made on this vexatious problem by the passage of the new rate law by the 1925 Parliament. As readers of the *Railway Age* will recall, the low rates on grain and flour and certain other commodities under the Crow's Nest Pass agreement came into full force in 1924 only to be suspended by the Dominion Board of Railway Commissioners and again restored by the government and the Supreme Court. Aside from the fact that these rates were unjustifiably low, they were also discriminatory, since they applied only to points on the Canadian Pacific which were in operation at the time the agreement was made, in 1897, and not at all on the Canadian National. The latter road, of course, had to apply them at competitive points. This caused loud protests from the communities which did not benefit.

Parliament had to do something. The logical action, according to most observers, would have been to abolish the Crow's Nest rates altogether, leaving the Board of Railway Commissioners unfettered in determining just and reasonable rates for all commodities in all territories.

senting members holding that such a change should come about only as the result of the general rate investigation—which latter has been proceeding for months with no decision as yet, and none expected until Parliament meets.

Business conditions, until the garnering of this year's bumper wheat crop, have not been so prosperous; consequently there has been a constant agitation for lower rates, particularly in the Prairie provinces, the Maritimes and the West. Ontario and Quebec have been less vociferous. Just what effect more prosperous times which should result from the excellent harvest will have on this agitation only time will tell. The people know, of course, that lower rates mean greater deficits on the part of the Canadian National—but, then, the Canadian Pacific does not have the public treasury to fall back upon and it will have to absorb some of the loss; the Canadian National's loss will be spread out over the taxpayers of the whole Dominion. Consequently, if a man is considerably more of a freight rate payer than he is a taxpayer, he can gain some benefit—on the surface—by forcing rate reductions by political pressure.

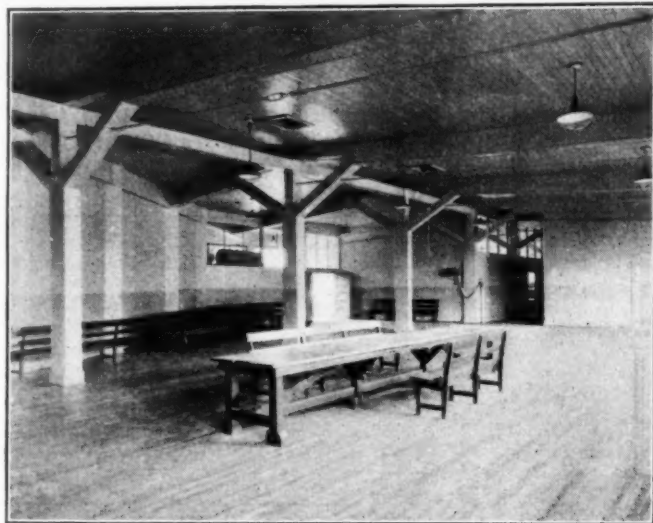
The Election—What Does It Mean?

The last Parliament was in the hands of the Liberal party, which had a bare majority. This did not satisfy the

Prime Minister, W. L. Mackenzie King, who arranged for a new election. The campaign was particularly bitter and the results unsatisfactory to everybody. The Liberals were defeated, but the Conservatives did not win a majority. The balance of power is held by the agrarian Progressives, who themselves lost heavily in the election. Parliament will meet again on January 7 and what will happen then no one knows exactly. If Premier King can secure the co-operation of the Progressives, perhaps the Liberals can remain in office for a time. If he cannot, the Conservatives will be asked to form a government, in which event they too will stay in power only by Progressive sufferance. Indications point to another election in 1926.

What significance has all this from a railroad standpoint? In the first place, the Progressives are a low rate party and many of them would like to build the Hudson Bay Railway. Possibly they may gain certain concessions on this score if a new election does not take place immediately. The Liberal party, on the other hand, is responsible for the present management of the Canadian National. If the Conservatives should come into power it is not likely that any radical change in personnel would be made, but the Conservative leader, Arthur Meighen, has been rather critical of some policies adopted by the present administration of the Canadian National and, possibly, with the Conservatives in power, the management of the property might not have quite so free a hand as it now has.

No party, however, is proposing any fundamental



Interior of Immigration Office, St. John, N. B.

change in railroad regulation or operation. There is a certain element in the Conservative party which carries on a constant agitation for amalgamation of the Canadian National with the Canadian Pacific or other measures designed to reduce its demands upon the Dominion treasury. This element, however, has not gained control of the party and until it does little fundamental change can be expected.

The Canadian Senate, which is not an elective body and whose members serve for life and which is now in the hands of the Conservatives, made a report on the railway situation toward the close of the last session of Parliament in which they recommended consolidation of the Canadian National with the Canadian Pacific, but even Mr. Meighen, the Conservative leader, spoke rather caustically of this report and the issues which it raised were not permitted to come into the election campaign, although a great effort was made to inject them.

Canada has not been satisfied with the rate of immigration since the war. With such a wealth of national resources her chief need at the present time is immigration. And the question of immigration has its railroad significance too. More population means more traffic—which is what the railroads need, the Canadian National particularly, since much of its mileage was built primarily for purposes of development and can never be expected to pay unless the population increases greatly. Both railroads maintain important colonization and immigration departments, which aid and foster immigration—particularly from the British Isles. Plans have been made for 1926 to handle 200,000 immigrants. Financial aid is provided for them by the British and Canadian governments and extremely low rates are offered by the transportation companies. It is believed that the new plans recently made providing for the closest co-operation between the government and the railroads, together with the advertisement which this particularly prosperous agricultural year has provided, will bring favorable results.

Wheat

Canada's wheat crop in 1925 is valued at \$466,755,000—or more than 25 per cent more than last year's yield. Principal field crops of the Dominion in 1925 will total \$1,112,691,000 in value, as against \$995,235,000 in 1924 and \$899,226,000 in 1923. The improvement, it is believed, is sufficient to assure that 1926 will be a good year for business in Canada. Agricultural experts in the Dominion have recently perfected a new type of wheat, known as "garnet wheat," which matures about 10 days quicker than ordinary wheat. This improvement will make possible the extension of grain raising further north to places where land is fertile but where the short summer has not permitted full maturity for grain. It should permit a considerable expansion in the potential wheat acreage of the Dominion.

So much for the backbone of Canadian railroad traffic. The outlook is bright in other quarters as well. There has been a great development of mining in Northern Ontario and Quebec and extensive hydro-electric developments for manufacturing purposes are in progress and more are projected.

In one of these sections—the Rouyn gold fields in Quebec—an interesting controversy has arisen. This region is not now served by railroad, but a line is under construction to be operated by the Canadian National. The Province of Ontario's railroad, the Temiskaming & Northern Ontario, wishes also to build a branch line into this section of Quebec. To this the Quebec government objects and has taken the case to the Privy Council in London—the court of last resort—to prohibit entry of the Ontario line into its territory.

The Maritime provinces, particularly the port cities of Halifax and St. John, continue their bitter agitation against the use by the Canadian National of Portland, Me., as an Atlantic port. In addition, some sections of opinion among them are demanding the return of autonomy with local political control to the old inter-colonial, which has been merged into the Canadian National.

Labor Conditions

There have been no serious labor troubles in the Dominion during the year. Relationships between managements and employees have for the most part been entirely cordial. The Canadian National is making rapid progress with the establishment of the so-called "Baltimore & Ohio plan" of management-employee co-operation in its shops and the results so far obtained are reported to be eminently satisfactory.

Mexican Railways Look to Bright Future

Provision for additional lines and modernization of existing facilities well under way

By Raymond Chambers

Assistant Professor of Economics, University of Buffalo

[This is the first of three articles by Mr. Chambers on the railway situation in Mexico, the remaining two of which will appear in early issues.—THE EDITOR.]

THE extent of the network of railways in Mexico is surprisingly great, considering the low state of development of nine-tenths of the people. The cause lies in the proximity of Mexico to the United States, its abundant supply of natural resources which the outside world has insistently demanded, and the considerable distances between many of the leading economic areas or

one to Tampico, the other to the Rio Grande. Furthermore the Mexican Railway has this year tried out its recent electrification which has proved successful. Then the continued improvement in the conditions of roadway, equipment and operation of most of the railroads has made the year a successful one. Lately comes news of the early return of the National Railways to private hands.

Mexican Railway Construction Plans

The most important railroad project of recent years on the Mexican plateau is that of the Mexican Railway which is preparing to build the long-talked-of air line between the capital and the oil city of Tampico. Early in 1922 the government amended the concession of the Pachuca & Tampico, owned by the Richard Honey estate. Shortly afterward the Mexican Railway bought the controlling interest in this company. The line was already built standard gage for 45 miles from Pachuca, the great silver city of east Mexico, to Ixmiquilpan (Hidalgo). At Pachuca it met the Mexican Railway's branch line. From Ixmiquilpan the road will run northwest to Zimapan, north and northeast to Tamazunchale, thence north-



One of the Mexican Railway Electric Locomotives at Orizaba

from them to the coast and northern frontier. While, with the exception of the Southern Pacific, little new construction has been done since Diaz's time, the railway mileage today is noticeably larger than 15 years ago.

The contrast with American roads is marked. Our average line has a good volume of traffic, low rates and moderately heavy operating costs and upkeep, and must face competition within its territory. Mexican roads, on the other hand, tend to fall into several monopolistic systems, of which today there are three: the National Railways of Mexico, the Southern Pacific of Mexico on the west coast, and the United Railways of Yucatan. No railroad in the United States except the Southern Pacific faces the diversity of conditions of the National Railways, and even the Southern Pacific does not possess the relative position within our country that the National Railways have in Mexico. The best comparison is with the Canadian National.

Traffic on Mexican railways is light, rates are high, wages and other operating costs above our own and maintenance is a source of heavy expense. The past year has seen a great advance in the filling in of the gaps in the railway network through the progress of the Southern Pacific's line from Tepic to the plateau to a stage nearing completion, while the Mexican Railway and the Orient have begun to give consideration to important extensions,



Along the Pueblo-Apizaco Line

east down the Moctezuma valley to Higo. The Tampico & El Higo, extending from Tampico southwest for 37 miles, is projected to Higo, and the Mexican Railway plans to buy the railroad, or else to take over the concession for the unfinished portion of this line and to connect with it at Los Chijoles, two miles below the present terminus. The total distance from Tampico to Ixmiquilpan will be 223 miles, and from Tampico to Mexico City, 385 miles. From Tampico to Tamazunchale the road will pass over the coast plain, with a maximum grade of 1 per cent. Between Mexico City and Ixmiquilpan the line traverses the gently rolling central plateau. But on the 70 miles be-

tween Ixmiquilpan and Tamazunchale is a drop of over 6,000 feet. The descent to the coast is a difficult one everywhere in Mexico, and this one is no exception. Many surveys have been run in the past, by the old Central, the National Railways, and the Mexican Railway. Some of their routes are exceedingly complex and sinuous, one called for a maximum grade of 6 per cent, another 8 per cent. The route selected has a 2 per cent compensated grade from Ixmiquilpan to Tamazunchale. This seems heavy, but in comparison with a grade of 4.1 per cent compensated on the mountain section of the Mexican Railway's line to Vera Cruz, it is clearly moderate. The old Central had a $1\frac{1}{2}$ per cent grade on one of its surveys, but that route would have been much longer. When completed the new line will give the capital a greatly needed

will greatly benefit the city of Tampico and the Gulf Coast Lines in the United States. Early in 1922, an American company is said to have applied for the concession, but nothing tangible has yet been accomplished.

The third project is the Santa Lucrecia-Campeche line. While greatly desired by the government to link up self-centered Yucatan with the rest of the country, via Santa Lucrecia on the Tehuantepec railway, the road will be very expensive, as it must traverse heavily forested plains and many of the largest rivers in Mexico.

One of the most important railway developments in recent years has been the electrification of the Esperanza-Orizaba section of the Mexican Railway. As with American roads, the purpose has been to reduce fuel costs, the number of locomotives and their maintenance costs, and also to permit heavier trains and more rapid traffic movement on congested portions of the line. While only one extensive installation exists, others would have been built by now had it not been for the revolutions.

The company is the oldest railway in Mexico, its trunk line being completed in 1873. This line from the capital to the port of Vera Cruz, 263 miles, is still the principal route between the two points and is one of the most difficult in the world. From sea level the road rises to a maximum elevation of 8,320 ft. at Acocotla, and then drops down another 1,000 to the capital (7,323 ft.).

In the early fall of 1922 the Mexican Railway Company shareholders ratified the proposal of their managers to electrify the section between Esperanza and Orizaba. The management had been considering the project for some time, and believed both the political and financial situations to be secure. The railroad could effect this installation cheaply because electric power lines already were located close to its line in numerous places. In November of that



The Railways of Mexico

direct outlet to its second large port, and also another through route to the north.

There are three important projects for railroad construction upon which no work has yet been started and only on the first of which is any contemplated in the immediate future. It is proposed to extend the Balsas-Acapulco line from its present terminus at the Balsas river south to Acapulco on the Pacific seaboard. This will be difficult, as it will be necessary to cross several ranges between the river and the coast, but the extension will give the capital its most direct outlet to the sea, and this was the intention when Colonel Hampson originally built the road from the capital south through Cuernavaca to the Balsas.

The second project is the Matamoros-Tampico coast line, 315 miles long. The building of this road will permit air-line travel between Tampico and Houston, and

year, the General Electric Company was authorized to build this section, the cost being estimated at \$2,500,000 and work was begun soon after. The section was completed by October, 1924, and trial trips were then run, but it could not be fully operated until the beginning of 1925.

The first ten locomotives for the new section were built by the American Locomotive Company, and the electrical work upon them was done by the General Electric Company. The locomotives are of the 150-ton, articulated type. They replace the famous Fairlie, double-end, oil-burning steam locomotives. The latest Fairlies are much larger than the earlier types, but the new electrics are even more imposing. All three types can be seen together in the Orizaba yards today.

The effect upon operating conditions has been exactly what was hoped for. As the superintendent of the eastern division said to the writer at Orizaba: "Electrification has

made this mountainous section, formerly the worst on the line, the most level and the easiest to operate of the entire system." In June, 1925, Vincent W. Yorke, chairman of the board, told the stockholders that the management had made a thorough test of the locomotives and was convinced of their efficiency.

It is estimated that the reduction in the number of trains will be from 38 to 59 per cent, in spite of the fact that heavy trains cannot be hauled up hill between 5.50 and 11.30 p.m., as this would necessitate an increase in the



On the Mexico North Western in the Cumbres

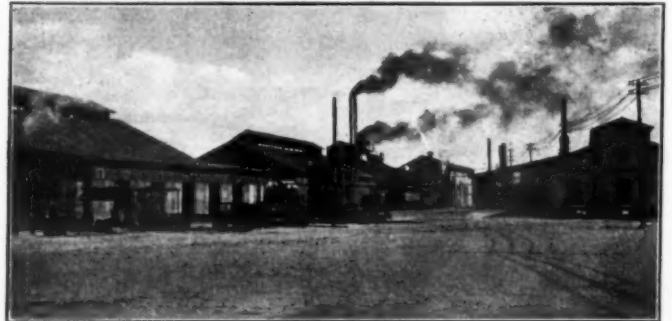
capacity of the power plant and result in a higher cost of power.

The company has recently contracted for the electrification of the adjoining section on the east, from Orizaba to Cordoba, and eventually will carry it on to Paso del Macho at the foot of the mountains. Although both are mountainous sections, and while that between Orizaba and Cordoba contains the famous Metlac ravine, yet neither offers operating problems in any degree equal to those formerly met with on the Esperanza-Orizaba section. The company has no present intention of electrifying the coast plain section east of Paso del Macho or the long stretch of line over the interior plateau.

At the same time that the Mexican Railway began to consider electrification, the National Railways undertook the study of two of their mountain sections, the Saltillo-

Carneros line in the northeast and the Cardenas-Las Palmas section of the Tampico-San Luis Potosi line. The latter line is almost as difficult in gradients as is the Mexican Railway's line (having a 3 per cent maximum) and has a heavy traffic since most of the oil burned in locomotives throughout northern and central Mexico is hauled up from Tampico. The Monterrey section, although much easier, is even more desirable to electrify, because it forms part of the main trunk line between Mexico and the United States. In 1922, electrification of the 90 miles from Saltillo south to Carneros was begun. The company's electrical engineer, G. L. Trevino, has estimated the saving from the use of electrical power at over \$500,000 annually. The Tampico project will result in a similarly great saving.

After completing the Carneros line, the company intended to electrify the still more important Tampico-San Luis Potosi division, and still other electrifications were



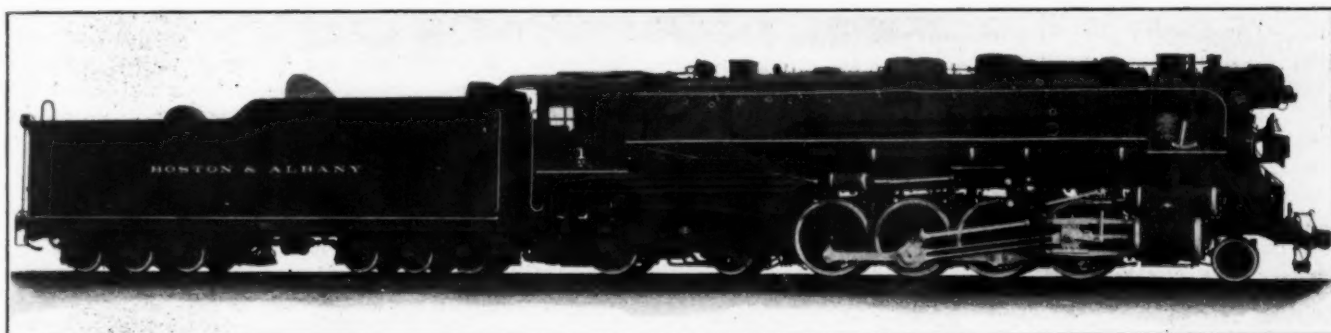
The National Railways Shops at Aguascalientes

contemplated in the future. The revolution of 1923-24 stopped the work of electrification on the Carneros section, but it is believed that work will soon be resumed.

Early in 1923, plans were being made by British owners to electrify the Coahuila and Zacatecas Railroad, a narrow gage line running 78 miles from Saltillo to Concepcion del Oro, with a 17-mile branch from San Pedro to Avalos, serving the mines of the Mazapil Copper Company. Presumably, nothing has since been done.



Florida East Coast Line Caboose Built by the Magor Car Corporation



The First Locomotive Built with an Articulated Four-Wheel Trailing Truck

Three New Locomotive Types in '25

All demonstrate that capacity possibilities of single unit driving wheel bases have not been exhausted

By C. B. Peck

DURING the past year three new types of steam locomotives have appeared on American railroads. These are the 2-8-4 type built by the Lima Locomotive Works, Inc., the 4-10-2, three-cylinder locomotives built for the Southern Pacific and the Union Pacific by the American Locomotive Company, and the 2-10-4 type recently received by the Texas & Pacific from the Lima Locomotive Works, Inc. These types all exemplify the continuation of the effort for increased locomotive capacity which has been characteristic of steam locomotive development throughout its history.

So much attention has been directed toward the marked increases in locomotive efficiency which have been effected during the past fifteen years that the fact is sometimes overlooked that the desire for more capacity is still the consideration which most largely affects the selection of motive power. It has been the capacity increasing ability of the efficiency increasing factors of locomotive design which has been most potent in establishing them as necessary parts of the modern locomotive. This applies to the brick arch, the superheater and the feedwater heater. In the case of the stoker and the booster, the entire aim was increased capacity.

This demand for capacity may take either one of two forms or a combination of both. In many parts of America it is still primarily a demand for increased train load. In some places, however, train loads have reached their prac-

ticable limit and the need for capacity is expressed in terms of horsepower for purposes of sustained speed. Indeed, the desire to reduce time on the road is a factor of growing importance even in the territory where the possibilities for still further increasing train loads are not yet exhausted. The Lima 2-8-4 type locomotive represents an effort to meet this demand for capacity in both directions as far as it is possible to meet it in a four-coupled locomotive. The high efficiency of its combination of large grate area and boiler with the limited maximum cut-off, in reality finds its greatest attractiveness in making possible the development of a high sustained horsepower. In the amount of heating surface in relation to its tractive force, it is one of the most liberally proportioned freight locomotives that has ever been built, and the capacity value of its heating surface is raised by the relatively large grate area.

The purpose of the additional pair of truck wheels incorporated in the 4-10-2 design of 10-coupled, three-cylinder locomotives is to meet this same demand for the utmost in horsepower capacity which can be secured from a locomotive with a given number of driving wheels, by providing the largest practicable boiler. The same may be said for the Texas & Pacific 2-10-4 type locomotives which are a development from the 2-8-4 type design.

The high capacity of these locomotives from a train-load standpoint is the result of two factors. One is the



A Powerful New 4-8-2 Type Locomotive Built in 1925—Boiler Pressure, 225 lb.; Driving Wheel Diameter, 69 in.; Tractive Force, including the Booster, 72,700 lb.

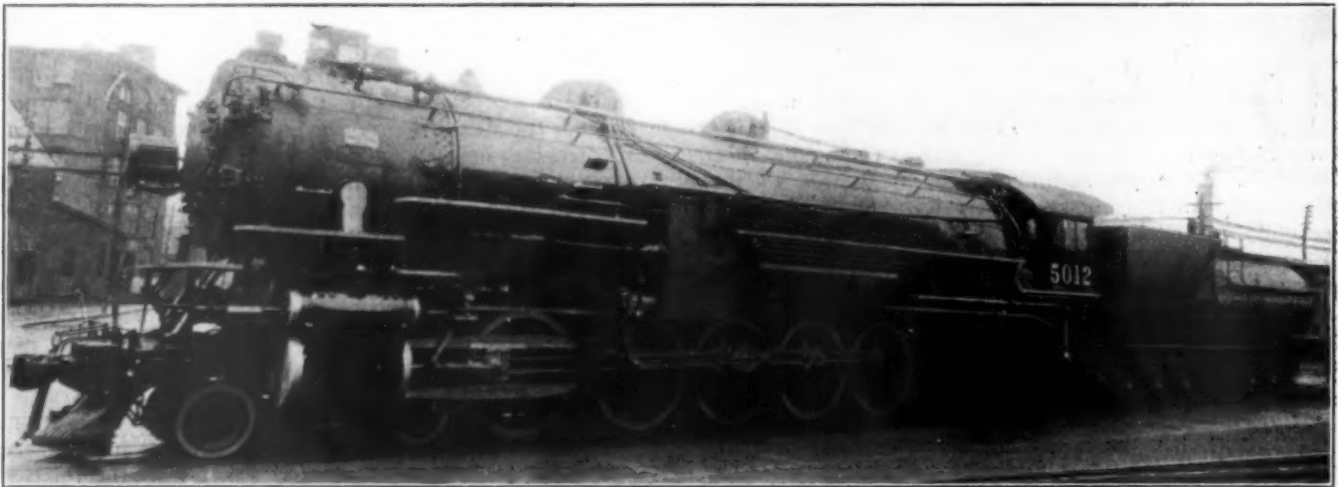
increase in tractive force for a given weight on drivers, made possible by the relatively smooth torque curves of the limited maximum cut-off in the case of the two-cylinder Lima locomotives, and of the three cylinders in the case of the American locomotives. The extent of this increase is measured by the change in the factor of adhesion from the customary 4 to 4.25 to from about 3.6 to 3.7 in the case of the above mentioned cylinder arrangements. The other factor is the use of the booster in the case of all except the Union Pacific locomotive, with its addition of approximately 12,000 lb. to the starting and slow speed drawbar pull.

Three developments of outstanding interest in detail design which have appeared during the past year were all incorporated in the two new locomotive types built by the Lima Locomotive Works. These are the articulated four-wheel trailing truck, the added capacity of which has been utilized to increase the size of the firebox and boiler; the cast steel cylinder with its marked saving in weight, which again permits more weight in the boiler, and the articulated main rod which, by delivering the driving force to two instead of to one main crank pin, has materially increased the limit of cylinder load which can be taken up by a single coupled driving wheel base from a single pair of cylinders without excessive crank pin and driving box

699, respectively, for the Southern Pacific and Union Pacific 4-10-2 types, and 725 for the Texas & Pacific 2-10-4 type, it is 889 for the Great Northern articulated locomotives. Such locomotives are essentially slow speed units, but are distinctly useful where heavy mountain grades would otherwise greatly reduce the train load. The smaller cylinder width clearance limits effected by the change from compound to simple cylinders increases the cylinder tractive force possibilities and, the reduced back pressure horsepower effects some increase in the practicable range of operating speeds.

A year ago in discussing the tendencies of equipment design during 1924 attention was called to the D. & H. high pressure Consolidation type locomotive designed by John Muhlfeld, the most important feature of which was probably its boiler pressure of 350 lb. The difficulty of building a boiler with a staybolt firebox to carry such a high pressure led to the development of a water tube firebox which was a marked departure from the customary type of boiler construction.

During the past year no locomotives have been built in America to carry such high boiler pressures, but there has been some increase in the use of pressures considerably above 200 lb., which for many years has been quite general practice. The locomotives of the new types re-



One of the First Locomotives in Which a Four-Wheel Engine Truck Is Combined with Ten-Coupled Driving Wheels

loads. Without this or some other means of performing a similar function, it is doubtful whether the two-cylinder limited cut-off principle would ever meet with much favor for locomotives with more than four pairs of coupled drivers. These improvements in details all open up possibilities for increases in locomotive capacity which are far from being exhausted in the locomotives to which they have so far actually been applied.

Articulated type locomotives still retain their usefulness under special operating conditions and several have been built during the past year. There is a marked tendency in the recent locomotives of this type, however, toward the use of simple cylinders. An outstanding locomotive of this type built during 1925 is the Great Northern 2-8-8-2 locomotive with four 28-in. by 32-in. cylinders, developing a starting tractive force, at a maximum cut-off of 65 per cent, of 127,500 lb. The inability of these locomotives to develop sustained horsepowers at all in proportion to their large tractive force rating is indicated by a comparison of the so-called boiler demand factor (tractive force \times diameter of drivers \div combined heating surface) of this locomotive with this factor for the year's new types already referred to. Whereas this factor is 605 for the Lima 2-8-4 type locomotive, 738 and

ferred to in this article all carry pressures ranging from 225 to 250 lb. While such pressures have not been uncommon on a few railroads in previous years and only a small number of the locomotives built during the past year have used such pressures, it is evident that more railroads are showing an interest in their possibilities. This suggests a preparation of the field which in a few years may lead to a sympathetic consideration of the big possibilities of the still higher pressures pioneered by Mr. Muhlfeld.

The outstanding development in the use of high pressures this year took place in Europe. A German locomotive has been built with a boiler generating steam at two pressures. Superheated high pressure steam at 850 lb. per sq. in. is used in a single high pressure cylinder and the exhaust from this cylinder, at about 200 lb. per sq. in., is combined with superheated steam at the same pressure drawn from the low pressure section of the boiler, to supply the two low pressure cylinders. Little is known as to the performance of this locomotive, but a marked economy in steam consumption is reported.

The tendency toward large tender capacity, to which attention was called last year, has continued during 1925. Many of the locomotives built during the year have been

equipped with tenders carrying from 12,000 to 15,000 gallons of water and as much as 20 tons of coal, and 5,000 gallons of oil.

The Diesel Locomotive

Although the visible evidences of development in the application of the Diesel engine to the locomotive have not been extensive during the past year, there has been a marked increase in the interest which has been taken in this subject, not only by the railroads, but among manufacturers who have had experience in building engines of this type for stationary and marine use. The Ingersoll-Rand Company has already developed its designs for 300 and 600-hp. locomotives to a point where they are commercially practicable, and the Baldwin Locomotive Works has gained considerable experience from the construction and operation of its 1,000-hp. unit.

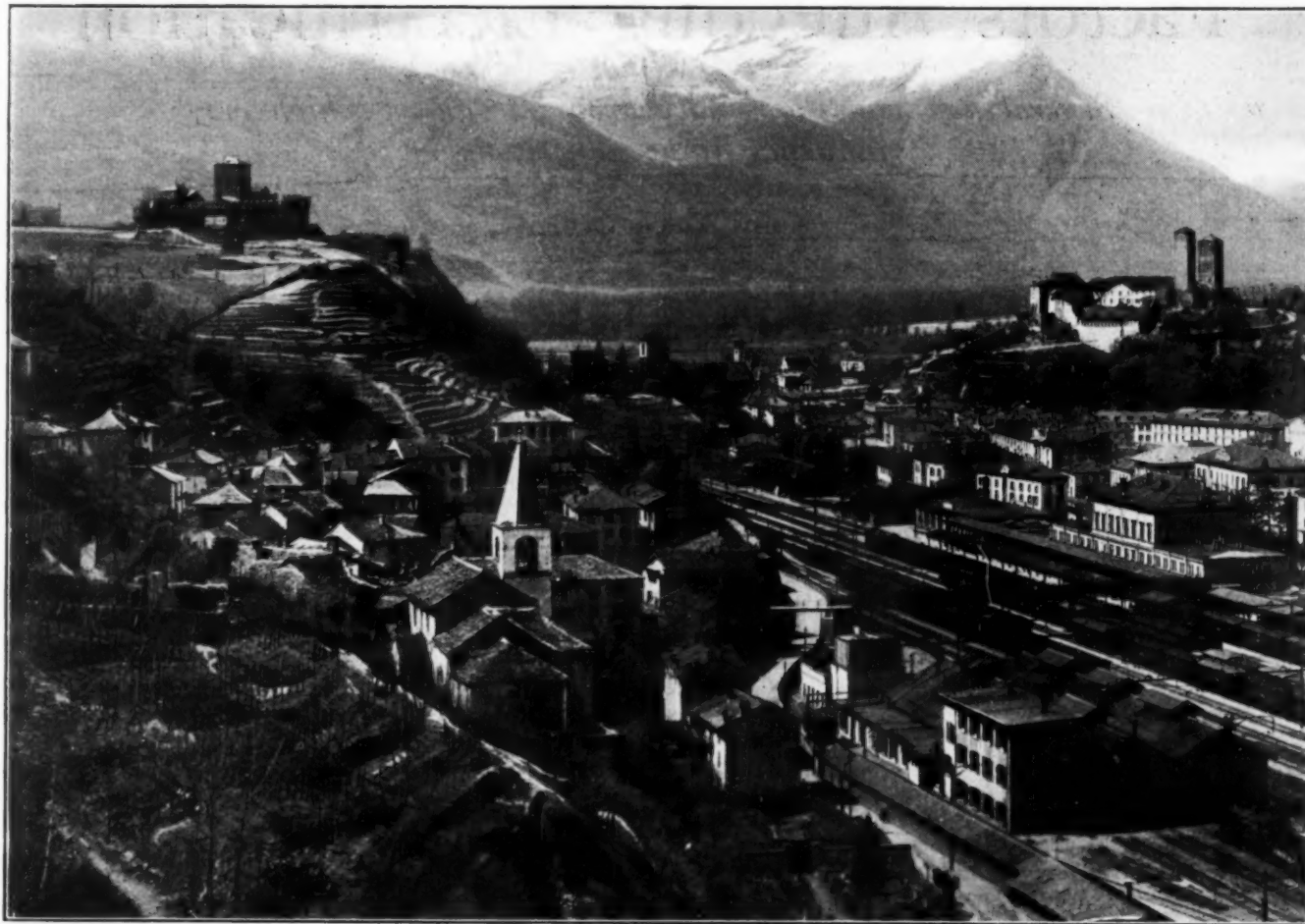
The characteristics of the Diesel engine combined with electric transmission are ideally adapted to switching and transfer service. The ability of this combination to deliver its full horsepower output to the drawbar at any speed gives in a comparatively small unit, a tractive force capacity at slow speeds which, in the steam locomotive, would require a much larger unit because the steam locomotive cannot develop its full horsepower at slow speeds. These relatively small power units are also well adapted to light branch line road service.

The future of the Diesel locomotive as a possible competitor of the steam locomotive in heavy road service,

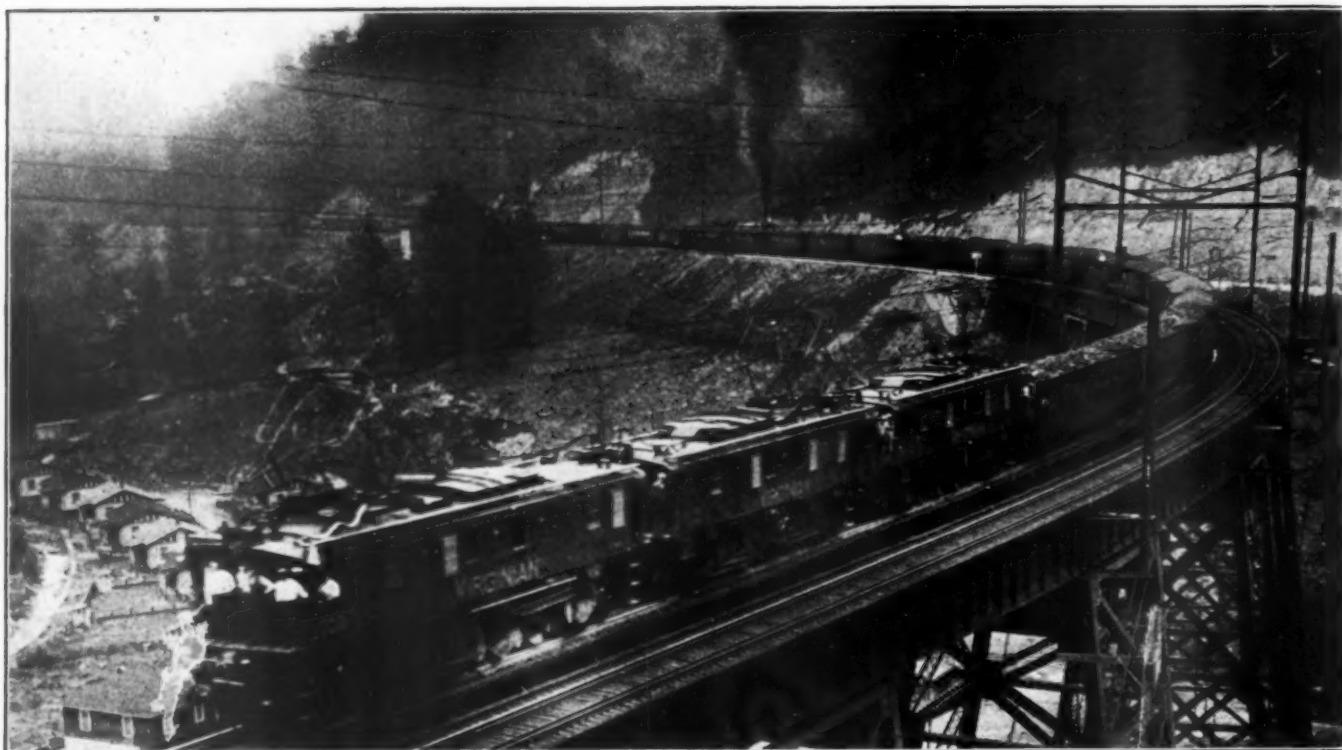
however, presents a problem of Diesel engine design, the solution of which will require the ability and ingenuity of the best minds in this field. Manufacturers of Diesel engines for stationary and marine service, in the interests of reliability and economy of maintenance, have tended to keep down to a very low figure the power output per cylinder. Requiring compression pressures of about 500 lb. to ignite the fuel in the cylinders, such engines frequently operate at mean effective pressures as low as 35 lb. in two-cycle engines and seldom higher than 100 lb. in four-cycle engines, with weights per horsepower of 200 to 300 lb. To reduce these weights, crank shaft speeds and mean effective pressures must be materially increased, which immediately increases the difficulty of effective cylinder and piston cooling to keep the working temperatures within the limits of safety.

The problems of design to meet these new conditions are not of the kind that can be solved on paper. Each step from the beaten path is essentially a step in the dark which must be taken with caution and which may have to be retraced to be taken again in another direction before large power units of light weight, operating at high speeds, finally became practical commercial possibilities.

There is little doubt but that the problem is possible of solution and it is being attacked vigorously. At the best, however, it will probably be some years before power units comparable in size with modern three and four-coupled steam locomotives will be commercially feasible. In the meantime, the smaller units, already practicable, will undoubtedly find a growing field for their application.



Bellinzona Station, Switzerland



One of the Virginian Locomotives at the Head of a 6,000-Ton Train on the 2 Per Cent Grade Between Mullens and Clarks Gap, W. Va.

Factors Affecting Electrification

Several new conditions have been introduced which may influence future development

By A. G. Oehler

ELECTRIC locomotive tonnage and steam railroad mileage electrified in America has continued to increase at about a constant rate during the past twenty years. Whether or not this rate is to continue, however, seems to be decidedly a matter for speculation.

The reason most commonly ascribed for the slow development of electrification is that the railroads have not been financially able to make major improvements, such as the installation of an electric traction system. In general, the financial condition of the railroads is improving, and if this reason for retarded development is correct, electric traction equipment will be installed at a greater rate in the immediate future.

The word efficiency is one which is used with considerable carelessness in comparing steam and electric locomotives. It is generally conceded that electric motive power, in spite of transmission losses, is more efficient than steam. Just how much more is a mooted question. The statement is often made that the electric locomotive is almost 100 per cent efficient and little improvement can be expected in this direction while there is a great opportunity for its steam contemporary. As a matter of fact electric motive power efficiency is not increased at the locomotive, but in the power house. Furthermore, statistics have been compiled to show that during the past four years the thermal efficiency of central stations has been increased 35 per cent and in the same period

of time steam locomotives have shown only a 12½ per cent gain.

On the other hand there is another factor which makes this argument rather pointless. Steam locomotive efficiency and capacity go hand in hand and the increase in capacity has probably been more important than the much touted efficiency. The size of the steam locomotive is limited by practicable length and clearances, but as the various devices have been added to improve efficiency the capacity or total horse power output of the machine has been increased correspondingly.

Electric locomotives are now in operation which have capacities greater than would have been thought possible a few years ago. Two Virginian locomotives apply 20,000 horse power to a 6,000-ton train on starting and continue to develop 12,000 horse power while taking the train up a two per cent grade at 14 miles an hour. Such performance has never been and perhaps never will be approached by steam locomotives. Nor is it necessary to have any such performance to meet even the maximum requirements of most roads.

There are a number of grades which have been considered for electrification, the traffic on which will probably be handled with steam for a long time to come because the efficiency devices on the steam locomotive have so increased its capacity as to enable it to take care of the increasing traffic. The traffic might be moved

more expeditiously in these cases by electrifying but here the road is confronted by the requirement of installing a contact system and purchasing locomotives which cost, pound for pound, about twice as much as steam locomotives.

It should be borne in mind, however, that traffic is increasing constantly and there are probably now a number of heavy grades and congested terminals where electric operation could be used with profit. There is a good possibility, too, that the cost of an installation will be reduced. Development charges have been in part responsible for high electric locomotive cost. One of the two large electric companies has advocated alternating current while the other has held out for direct current. Now three things have happened. A new manufacturer has appeared in the field, the motor-generator locomotive has been developed, and all of the manufacturing companies have declared their willingness to make any kind of equipment that may be wanted. If the number of basically different types of electric locomotives can be made a minimum it is only reasonable to suppose that the cost of manufacture will be greatly reduced even though the type decided upon does not happen to be the one which is theoretically nearest to perfection.

Long locomotive runs, Diesel locomotives and rail motor cars have also had a somewhat retarding influence. Long locomotive runs result in an improved utilization of motive power and in part offset the greater availability of the electric locomotive.

Much is expected of the Diesel locomotive, which so far at least has generally been a Diesel-electric locomotive. There are good possibilities for a mechanical or hydraulic drive but these have not yet been used to any considerable extent. Waiting to see what the Diesel locomotive is going to do has probably caused some delay in the minds of those considering electrification. Actually Diesel-electric locomotives are now being used for switching and are being built for light road service.

Equipment Ordered and Placed in Service

Electric operation of the Staten Island line of the Baltimore & Ohio between South Beach and Fort Wadsworth was started on June 5. The Tottenville sub-division was placed in operation on July 1 and electrification of passenger service on the Arlington sub-division is about completed. Up to the present time, this electrification has been confined to suburban passenger traffic. A total of 90 motor cars and 10 trailer cars have been placed in service and 21.6 route miles, including approximately 50 miles of track, have been electrified. Probably the most interesting phase of this installation is the supervisory power control system and its use in connection with the automatic sub-stations.

Electric operation of the Virginian was inaugurated on September 21. This installation is particularly remarkable for the fact that two electric locomotives are used to take a 6,000-ton train up a 2.07 per cent grade, 15 miles long at a speed of 14 miles an hour. The installation represents the greatest amount of power which has ever been used for moving a train and illustrates the capability of electric motive power for heavy grade operation.

On the Detroit, Toledo & Ironton, 17 miles of track have been equipped with an overhead contact system supported on reinforced concrete arches. One locomotive has been built and tested which is decidedly an innovation in the motive power field. It is the first commercial motor-generator locomotive. Several others for other railroads are now under construction. It receives power from a 23,000-volt trolley and the mechanical design is unique in many ways, particularly for the fact that the

traction motor frames serve also as locomotive truck frames.

Electric operation on the Long Island was extended from Jamaica, L. I., to Babylon, L. I., a distance of 28 miles. This work was authorized in April, 1924, and electric operation was officially begun between New York and Babylon on May 20, 1925. A definite program has also been laid out by this road for further increases in its electric operation to be made during the next four years.

The Great Northern is now installing electric traction on the 24-mile section between Skykomish and Cascade Tunnel on the west slope of the Cascade mountains in Washington. Motor-generator type locomotives will also be used on this installation which will receive power from an 11,000-volt a. c. trolley. The locomotives are designed to operate temporarily at reduced speed because of present limited power supply and motor-generator tenders will be used to allow the old three-phase Cascade Tunnel locomotives to operate from the single phase trolley.

The Illinois Central suburban electrification in Chicago, is now well under way and the road expects to have electric trains in operation by February, 1927, which is six months ahead of the time specified in the agreement between the railroad and the city. This undertaking involves the electrification of 28 miles of line with a 1,500-volt d. c. contact system. The sub-station equipment includes a total of 33,000 kw. of synchronous converters and 3,000 kw. of mercury arc rectifiers. There will be seven sub-stations in all.

Electric Locomotives

Seven motor-generator locomotives are now under construction for the New York, New Haven & Hartford. They will operate from an 11,000-volt a. c. trolley and will have such characteristics as to permit them to operate satisfactorily in conjunction with the series type locomotives now in service.

Two 170-ton freight locomotives, seven 100-ton switching locomotives and 29 motor car equipments are now being delivered to the New York Central. The motor car equipments each consist of two 160 hp. motors and electro-pneumatic control to supplement the present motive power in the New York suburban electric zone.

During the year 14 Diesel-electric locomotives have been ordered and several have been placed in service. Roads which are now operating this type of motive power or which will soon have them in service are the Baltimore & Ohio, the Lehigh Valley, the Chicago & Northwestern, the Delaware, Lackawanna & Western, the Central of New Jersey, the Long Island and the Pennsylvania.

Diesel Electrics

The Canadian National has placed a Diesel-electric articulated car and a single 60-foot Diesel-electric car in service. The latter recently made a 2,937-mile run in slightly under 67 hours at an average speed of 43½ miles an hour during which time the engine ran continuously. The engines in these cars weigh only about 15 pounds per horse-power or 51 pounds per horse-power including the generator and bedplate.

Six more of the smaller type of cars are now under construction.

Another installation using the same principle is being made by the New York Central in which a 200 hp. Diesel engine will drive a generator which in turn will drive the motors on a car similar to the present multiple unit cars used in the New York terminal.

The gas electric rail motor car for light traffic requirements has been well received by the railroads this year, some 60 cars having been ordered by about 25 different roads.

The Year in Maintenance of Way

The 39-ft rail was the outstanding development of 1925—More power equipment employed

By Walter S. Lacher



Baltimore & Ohio Extra Gang That Relaid Nine Track Miles of Rail in Four Days

THE adoption by the American Railway Association of a new specification for steel rails in which 39 ft. is established as the standard length is the outstanding achievement of the past year in maintenance of way. The new specifications represent the result of several years' effort by the Rail Committee of the American Railway Engineering Association in close co-operation with the manufacturers, and the specification as now adopted has the endorsement of the mills who accept all of its provisions, including the six-foot increase in length, without premium. The new specification represents a distinct advance but cannot be said to embody any requirements of manufacture designed distinctly with a view to the elimination of the transverse fissure, as investigators still disagree as to the exact cause of this all too prevalent defect. The increase in length of rails, however, offers a distinct opportunity. Not only does it promise to reduce the expense of track maintenance through a reduction in the number of joints, but with fewer joints to buy the railroads can be expected to look with greater favor on the making of greater outlays for the joint construction in the way of better designs of joint bars or a higher quality of material in the bars and bolts.

Heavier Rail Used

While the year just closed does not mark any particular development in the use of larger rail it has evidenced a distinct tendency in this direction, particularly on the western railroads which until recently had confined their purchases to a section not exceeding 90 or 100 lb. per yd. But increases in the unit weight of rail have not been reflected by any increase in the tonnage of rail purchased. In fact at no time since the end of government control has the volume of rails purchased reached the estimates

which various analysts have set up as necessary to compensate for the deficiencies of the war period.

The explanation for this is to be found in the measures generally adopted by the railroads for the conservation of the rail, prominent among which are the building up of battered ends by the use of the welding torch and the application of new joint bars. A new development along this line during the past year and still in the experimental stage is the sawing off of battered ends without removal from the track.

Canting of Rails

Another development along the same line which comprises the first outstanding benefit to accrue from the work of the Joint Committee on Stresses in Track is the adoption by the American Railway Engineering Association of a report of its Committee on Track definitely recommending the canting of rails. The general restoration of this old-time practice has been under way for a number of years so that many of the railroads are now following it. Nevertheless, the endorsement of this practice by the A. R. E. A. must be ascribed primarily to the results of the investigations made by the Committee on Stresses in Track.

No outstanding developments can be cited with regard to the railroad cross tie, but every indication points to the fact that the past year was one of further progress in the use of ties subjected to preservative treatment. The time is not far off when the placing of an untreated tie in track will be a rare exception.

It is in the field of track work rather than in the track structure and its design that the greatest advancement took place in 1925. The year was not one of a labor shortage; in fact there were almost no localities in which

an adequate supply of labor was not to be had. Nevertheless it was in the development of labor saving methods and equipment that the most marked progress was made. That maintenance of way officers are encouraging developments along this line is indicated by the fact that some 8 or 10 different devices designed to reduce the labor of lining track have been brought out during the past two years. But the most marked development of the year has been in the larger items of equipment, in which hand labor is entirely supplanted. Most of these are still in the experimental stage, but the fact that large expenditures have been authorized for the purpose of carrying on such development work indicates a decided trend and points to the marked change in the methods of conducting the major track maintenance items which is to be expected in the future. Among recent inventions may be mentioned a machine for removing ballast from between the ties, one for lifting track out of face, a sweeper for cleaning up deposits of cinders and a vacuum cleaner for renovating ballast.

More Attention to Unit Costs

There is also marked evidence of a much more critical analysis of labor costs in maintenance of way work, as indicated by the wider adoption of the practice of discontinuing the use of a stretch of track on multiple track lines for the purpose of permitting such operations as rail laying or ballasting to be conducted with greater speed and efficiency. Greater attention is also being given to unit costs and to methods of ascertaining the most economical ways of performing various unit operations.

Stabilization of Employment

All these efforts toward improvement lead to the common conclusion that the fundamental problem in track maintenance is the man problem and that this arises

primarily from the seasonal nature of the work. It has also become clearly evident that improvement in personnel must be looked for primarily in measures designed to spread the work over a larger portion of the year so that a relatively larger proportion of the men will be afforded year-round employment. Thus far, however, no general improvement has been made along this line, although railway employment statistics show a much smaller fluctuation between maximum and minimum forces than in earlier years.

Bridge and Building Work

Bridge and building work on the railroads keeps well abreast of general developments in this field. This has been notably true in the current advancement in the proportioning and mixing of concrete. The difficulties of providing adequate supervision for the more scientific methods of determining mixtures on the smaller concrete jobs has militated against the application of these improved methods on the great bulk of the work. But on a number of more important structures they have been applied with marked success. This development is one of education and initial progress is necessarily slow, but there is every reason to believe that its dissemination in railway work will be equally as rapid as in any other field of construction. Pre-cast concrete construction, particularly as applied to retaining walls, has made distinct progress during the past year. This is a field especially adaptable to railway conditions which frequently impose serious obstacles to any construction plan which calls for any appreciable amount of time between the completion of the structure and its use under traffic. These same conditions have also led to rather widespread experimental use of quick-setting cement on railroad work during the past year.



Times (London) Photo

Why Commutation Rates Are Low in Paris

Progress Toward Consolidation

I. C. C. and President Coolidge urge amendment of law to omit requirement of complete plan

By Harold F. Lane

COMPARATIVELY little actual progress toward a consolidation of the railway properties of the United States into a limited number of systems has been made during the past year, although a good deal of negotiating and planning of prospective mergers has been under way and it is believed that further progress will result from the more general acceptance of the belief that more can be accomplished by permitting voluntary consolidations, subject to the approval of the Interstate Commerce Commission, than by attempting to make them conform to a pre-conceived plan.

After struggling for some time in an effort to comply with the direction of the law to prepare a general plan, following extensive hearings on the tentative plan issued on August 3, 1921, the commission, or at least a majority of its members, have expressed doubt as to the wisdom of the provisions of the law that require it to prepare a complete plan, and a belief that results as good and perhaps better are likely to be accomplished with less loss of time if the process of consolidation is permitted to develop under the guidance of the commission in a more normal way. As long ago as February 4, 1925, a letter expressing these conclusions and submitting a proposed amendment to the consolidation provisions of Section 5 of the interstate commerce act was sent by the commission to the chairman of the Senate committee on interstate commerce.

President Coolidge has also recommended that Congress amend the law to authorize consolidations under the supervision of the commission and there are some prospects that such legislation will be passed at this session.

Meanwhile some progress has been made under the provisions of paragraph 2 of section 5, which empowers the commission to authorize the acquisition of control of one carrier by another in a manner not involving consolidation and the commission has concluded hearings on the Van Sweringen unification plan, which would bring some 9,000 miles of line under the control of a new New York, Chicago & St. Louis Company. Hearings are also in progress on the application of the Norfolk & Western to acquire control of the Virginian and several other cases are pending before the commission.

Authorizations of control have been issued by the commission since the law was passed in 1920 involving some 26,000 miles of line, but during the year 1925 those issued have involved a little over 3,000 miles, as compared with nearly 12,000 miles in 1924. During the year covered by the commission's annual report, ended October 31, 39 applications were filed, 26 authorizations were issued and 3 applications were withdrawn. The authorizations under Paragraph 2 of Section 5 issued by the commission during the past year, including some issued since the date of the annual report, are as follows:

Authorizations of Control of One Carrier By Another Carrier

Carrier acquiring control	Owning company	Control acquired	
		Miles of road	How acquired
Atchison, Topeka & Santa Fe Ry. Co.	Elkhart & Santa Fe Ry. Co.	56.00	Purchase of stock and lease.
Atlantic Coast Line R. R. Co.	Moore Haven & Clewiston Ry. Co.	14.00	Purchase of stock and lease.
Baltimore, Chesapeake & Atlantic Ry. Co.	Baltimore & Eastern R. R. Co.	40.00	Purchase of stock.
Buffalo, Rochester & Pittsburgh Ry. Co.	Rural Valley R. R.	11.70	Lease.
Chesapeake & Ohio Ry. Co.	Ashland Coal & Iron Ry. Co.	27.66	Lease.
	Long Fork Ry. Co.	36.31	
	Millers Creek R. R. Co.	4.53	
Chesapeake & Ohio Ry. Co.	Sandy Valley & Elkhorn Ry. Co.	31.00	Purchase of stock and lease.
Edward Hines Yellow Pine Trustees	Gulf & Ship Island R. R. Co.	16.00	Lease.
Galveston, Harrisburg & San Antonio Ry. Co.	San Antonio & Aransas Pass Ry. Co.	729.00	Lease.
Gulf & Interstate	Santa Fe Dock & Channel Co.	4.54	Purchase of stock.
Illinois Central R. R. Co.	Gulf & Ship Island R. R. Co.	307.00	Purchase of stock.
Kansas City Southern	Kansas City & Grandview	13.48	Purchase of stock.
Los Angeles Junction Ry. Co.	Central Manufacturing District (Inc.)	7.20	Lease.
Maine Central R. R. Co.	Hereford Ry. Co.	52.85	Purchase of stock.
Monongahela Ry. Co.	Secotts Run Ry. Co. and Monongahela & Ohio R. R.	23.70	Purchase of stock and lease.
		2.50	
Monongahela Connecting R. R. Co.	Eastern R. R. Co.	.57	Purchase of stock.
New Orleans, Texas & Mexico	Sugarland	38.94	Purchase of stock.
New Orleans, Texas & Mexico	Asherton & Gulf	32.10	Purchase of stock.
New Orleans, Texas & Mexico	Rio Grande City	22.00	Purchase of stock.
New York Central R. R. Co.	Hudson River Connecting R. R. Corp.	26.50	Lease.
Norfolk & Western Ry. Co.	Buck Creek R. R. Co.	1.24	Lease.
Pennsylvania	Pennsylvania, Ohio & Detroit	791.28	Exch. of stock.
St. Louis-San Francisco Ry. Co.	Jonesboro, Lake City & Eastern R. R. Co.	86.50	Purchase of stock and lease.
St. Louis-San Francisco Ry. Co.	Muscle Shoals, Birmingham & Pensacola	159.00	Purchase of stock.
Southern Pacific Co.	San Antonio & Aransas Pass Ry. Co.	729.00	Purchase of stock.
Southern Pacific Co.	Lake Tahoe Ry. & Transportation Co.	16.50	Lease.
Stewartstown R. R. Co.	New Park & Fawn Grove R. R.	9.00	Lease.
Terminal R. R. Association of St. Louis	St. Louis Merchants Bridge Terminal Ry. Co., East St. Louis Connecting Ry. Co., St. Louis Transfer Ry. Co.	27.76	Lease.
Wabash	Ann Arbor	293.70	Purchase of stock.
Western Pacific R. R. Co.	Sacramento Northern R. R.	165.03	Purchase of stock and bonds.
Total		3,047.59	

¹Not included in "Total." Same mileage shown below for Southern Pacific Co., control acquired through "purchase of stock."

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1925 Supply and Equipment Costs Show Marked Stability

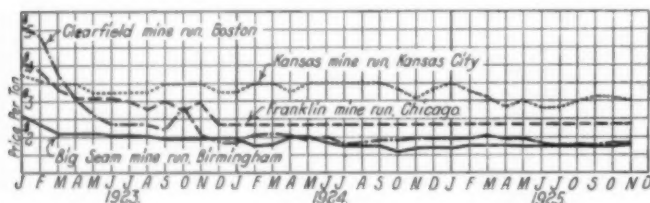
Survey of last twelve months shows uniformity in prices of materials at previous levels

By D. A. Steel



THE year 1925 was one of pronounced steadiness in material prices at levels on a par with those reached in the previous year. It was also a year of extensive activity in stock reductions while the volume of purchases were slightly in excess of those of the previous year.

In a large measure the market conditions of 1925 for

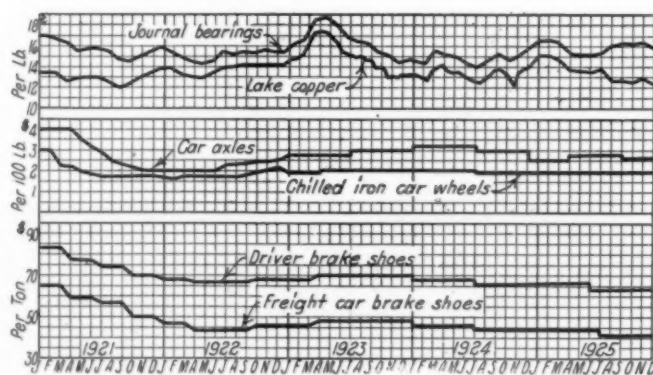


Typical Spot Coal Prices for a Three-Year Period

railway material and supplies presented the general aspect that distinguished 1924 from other post-war years. It will be recalled that 1920 and 1921 were years of great inflation of prices, followed by equally marked deflations and subsequent reactions, which kept the market in a state of turbulence until well into 1923 when as a result of the definite progress made in readjusting industry and because of enforced conservation in all lines of endeavor, the market assumed an aspect promoting confidence. There were those who questioned the soundness of the relatively high levels of prices in 1924. But the latter part of that year witnessed an orderly scaling down of these prices and thenceforth a steadiness generally in the trends which indicated a stability of business strikingly in contrast with that of the earlier post-war years. It was a continuation of this steadiness in price trends at approximately the levels reached in the preceding year that characterized the

events of the year just ended. Thus prices which under the urge of optimistic forecasts in 1924 had shown a disposition in the opening weeks of 1925 to regain the ground lost in the general decline of the previous spring, soon fell back into line and with few exceptions continued on a generally horizontal plane about 90 per cent higher than pre-war levels until late in the fall when seasonal demands stiffened the market or brought slight advances.

If the past year is to be distinguished from its predecessors, that distinction may be said to lie in the accentuated character of this steadiness in the general price trends.



Price Trends of Typical Equipment Items

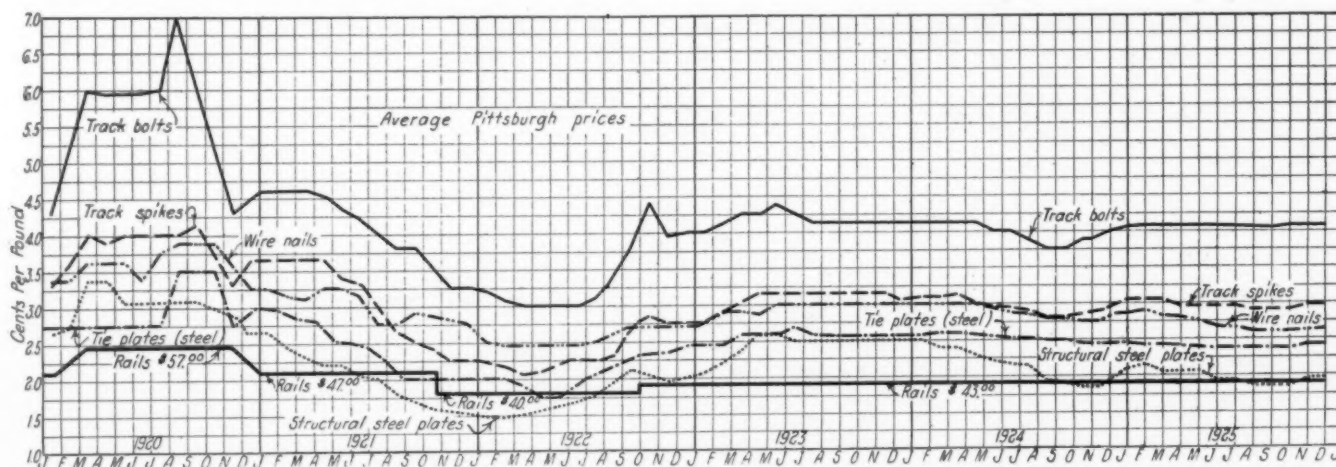
It is a difficult problem, obviously, to encompass market conditions for a territory as extensive as the United States and for the wide range of commodities of which this survey deals within a single rule and equally hazardous to resort to specific trends to suggest the general. Some idea of the relationship which market conditions of the past year bear to those of the previous year and to former

years, however, may be obtained from the charts which reproduce the representative price trends of typical commodities among various classes of railway material. These charts on the whole reveal a series of trends in 1924 strikingly free from fluctuations. Except possibly for scrap their definiteness in direction is also noticeable.

Market Favorable to Current Buying

It is not only in their comparative steadiness that the market conditions of 1925 are to be distinguished from

able to numerous factors. Buying by railroads was done on a distinctly conservative basis during the year. It was particularly a dull year for cars and locomotives, while on many roads the expenditures for materials and supplies required for maintenance were unusually light, owing principally to a pronounced effort made to reduce surplus stocks. In large part these retrenchments in purchasing were more than offset by the activity in the markets of roads that had already reduced their surplus stocks or had undertaken enlarged programs of work, so that on the

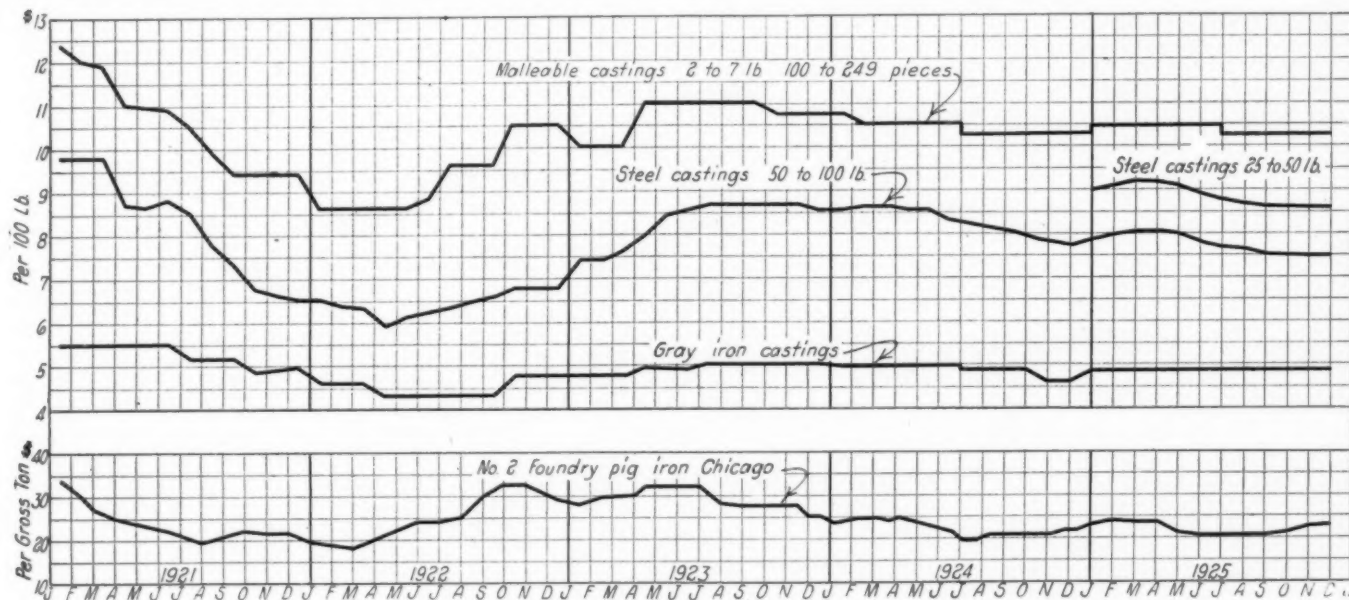


Trend of Prices of Iron and Steel Items Applicable to Roadway and Structures

those of previous years. There is also the strong indication of increased regularity in the relationship between the trends of the various commodities. There is no occasion to go beyond the charts to find improvement in this respect. Thus, relative to 1924 and previous years, the year 1925 presents a condition in prices akin to that of a pendulum as it again approaches repose after having

whole the total quantity of materials and supplies purchased by the railroads last year, exclusive of cars and locomotives, exceeded the volume of the previous year.

The general effect of the spotted and intermittent character of railway purchases during the year, however, was to depress rather than to elevate prices. This was in turn offset by record building activity throughout the year



Range of Prices of Materials Used by Railway Mechanical Departments

been agitated in its swing. At all events the year reveals a condition of uniformity and stability in the market which affords an encouraging aspect for the coming year. It is decidedly the aspect sought by buyers who prefer current to speculative buying in the purchase of railway materials and supplies.

The stability of the market in the past year is attribut-

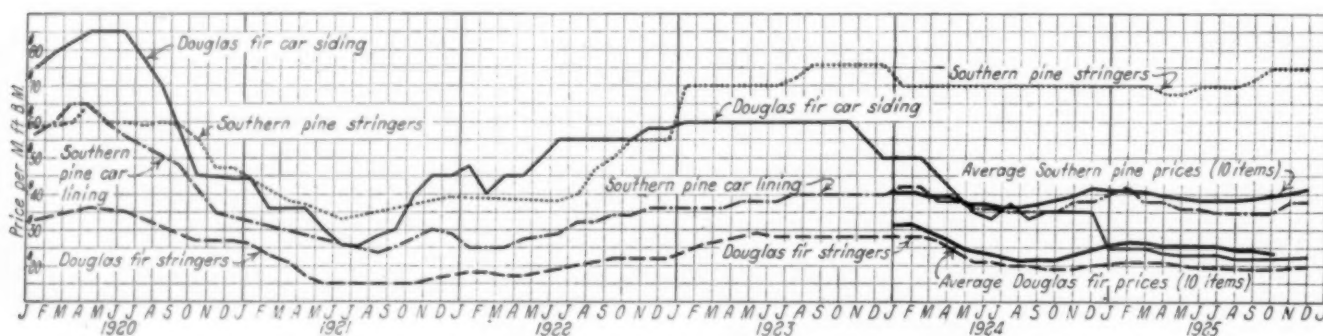
and as a result of an enlarged demand for material created by favorable crop conditions in the south and west. But the prevalent practice for the retail buyers as well as for industry to work with minimum stocks and the conspicuous conservatism in buying gave little opportunity for radical fluctuations in price levels, and practically no outlet for forced prices. Thus the year was practically

a buyer's market until late in the fall. That the few advances made are chiefly of a seasonal character and will experience a recession before long similar to that which occurred at the beginning of 1925, notwithstanding the prospects of increased purchases by railroads, is indicated by the sustained determination apparent in the railway field to buy carefully and in view of the prospect of greater stabilization in purchasing throughout the year.

Conditions in the iron and steel industry afford a good indication of the general market of 1925. Of the six representative items of railway purchases listed in the charts of roadway and structures material, only one, track bolts, shows any advance in average prices over 1924. In

passed through the typical cycle of the preceding year, with prices up in the spring and fall and down in the summer.

The small number of cars and locomotives built by the railroads in 1925 had its effect in limiting the demand for iron and steel but this was counteracted by widespread building activity, although it was not until September that the volume of orders was adequate to effect an increase in the tonnage of unfilled orders on the books of the leading interest in this field. But largely as a result of an increase in the volume of railroad purchases in the fall, iron and steel prices assumed a firmer tone and production increased. By the middle of November the aver-



Price Ranges of Representative Lumber Items Over a Six-Year Period

this case the price was practically stationary during the year and the average is from 7 to 15 points higher than those prevailing where large orders were involved. There were declines in the prices of track spikes, wire nails and structural steel, while those for tie plates remained reasonably steady. In the chart of equipment items only one of the five representative materials displayed any pronounced tendency toward fluctuation, the price of journal bearings following closely the trend of lake copper. The price of chilled iron wheels remained stationary, while the prices of car axles, locomotive and freight car brake shoes declined slightly. In the chart of representative materials used by the mechanical department the prices of malleable castings and gray iron castings were practically stationary while steel castings disclosed a gradual decline. Scrap

age daily sales of iron and steel were exceeding the rate of production and practically all mills were working at a rate exceeding 80 per cent of capacity. This has subsequently led to moderate advances in the prices of a number of items, notably track materials and structural shapes and plates, while other advances in prices are anticipated in the early months of 1926. It is not expected, however, that advances in iron and steel prices will be permanent or widespread.

An analysis of Chicago and Pittsburgh prices for representative iron and steel commodities during the year discloses that the difference between conditions now and before the "Pittsburgh Plus" plan of pricing material was abolished is solely one of degree. In general there is still a differential between Chicago and Pittsburgh prices al-

DOUGLAS FIR MILL PRICES (ACTUAL RAILWAY PURCHASES) Year 1925.											
	Dec. #	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.
Stringers, 8 by 16, 32 ft., No. 1, common....	\$20.00	\$20.50	\$21.00	\$21.00	\$21.00	\$20.50	\$19.50	\$19.50	\$19.00	\$19.00	\$19.00
Timbers, 12 by 12, 32 ft. and under, No. 1 common.....	17.00	17.50	17.50	17.50	17.00	17.00	17.00	17.00	16.50	16.00	16.00
Dimensions, 2 by 6 and 8, No. 1 common.....	17.00	17.50	17.50	16.50	16.50	16.50	16.50	16.50	17.00	16.50	16.50
Dimensions, 2 by 12, No. 1 common.....	17.50	18.00	18.00	17.50	17.50	17.50	17.50	17.50	17.00	17.00	17.00
Boards, 1 by 6, No. 1 common.....	18.00	18.50	19.00	18.00	18.00	18.00	18.00	18.00	17.50	17.00	17.00
Car framing, select common.....	20.00	21.00	22.00	22.00	21.00	20.00	20.00	20.00	19.00	19.00	19.00
Car sills, 41-45 ft.....	22.50	25.00	25.00	25.00	23.50	23.00	23.00	23.00	22.00	22.00	22.00
Car siding, No. 2, clear and better.....	35.00	38.00	43.00	45.00	45.00	45.00	45.00	42.00	42.00	42.00	39.00
Car lining, select common, D. & M.....	21.00	21.00	21.00	21.00	21.00	23.00	23.00	23.00	23.00	23.00	22.00
Car decking, finished, select common, D. & M.....	21.00	22.00	23.00	23.00	23.00	23.00	23.00	23.00	20.00	20.00	19.00
Switch ties, common.....	16.50	17.00	17.50	17.00	17.00	17.00	16.50	16.00	16.00	16.00	16.00
Crossing plank, common.....	17.00	17.50	17.50	17.00	17.00	17.00	16.50	17.50	16.50	16.00	16.00
Average.....	24.25	25.35	26.20	26.05	25.75	25.70	25.55	25.35	24.55	24.35	23.85
#1924											
SOUTHERN PINE MILL PRICES (ACTUAL RAILWAY PURCHASES) Year 1925.											
	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
Stringers, 7 by 16, 28.....	\$70.00	\$70.00	\$70.00	\$68.00	\$68.00	\$70.00	\$70.00	\$70.00	\$72.00	\$75.00	\$75.00
Bridge material, 12 by 12, 22.....	40.00	40.00	40.00	40.00	40.00	38.00	38.00	40.00	40.00	42.00	44.00
Car sills, 36 ft. to 40 ft.....	44.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	45.00
Car lining.....	40.00	42.00	38.00	38.00	36.00	36.00	35.00	35.00	35.00	35.00	38.00
Car siding, 9 ft.....	56.00	54.00	54.00	51.00	51.00	49.00	47.50	48.50	50.00	49.00	53.00
Planking, white oak, 3 by 10, 16 ft.....	27.00	27.00	27.00	25.00	25.00	25.00	25.00	27.00	27.00	27.00	27.00
1 by 8, 14 ft.....	37.00	37.00	37.00	37.00	37.00	35.00	35.00	35.00	35.00	38.00	38.00
2 by 4, 10 ft.....	30.00	30.00	30.00	28.00	28.00	24.50	26.50	27.00	27.00	27.50	30.00
2 by 10, 16 ft.....	32.00	32.00	32.00	30.00	30.00	26.50	28.50	29.00	29.00	29.50	32.00
Car decking, 2 in. - 10 ft.....	34.00	34.00	34.00	34.00	32.00	32.00	32.00	32.00	33.00	34.00	35.00
Average.....	40.30	40.30	39.10	39.10	37.20	37.20	36.20	36.20	37.10	38.10	41.60

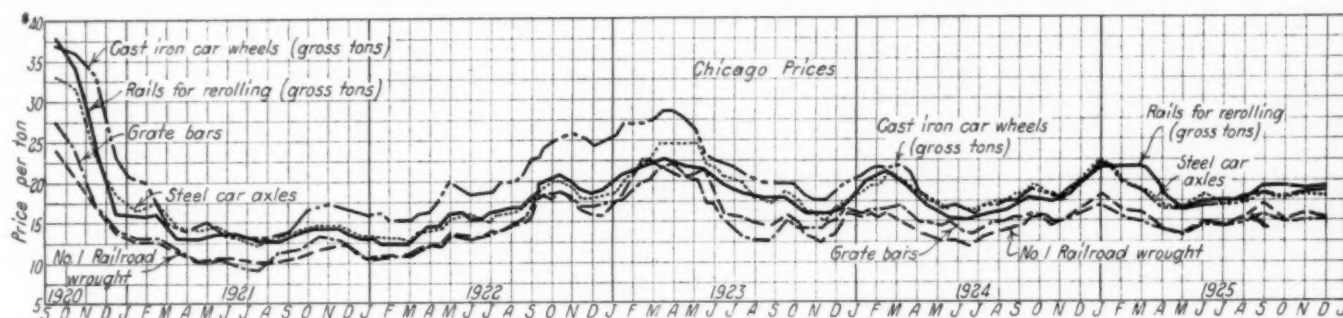
though this is now much less than the freight rate from Pittsburgh to Chicago.

Douglas Fir Prices Decline

The lumber market for the year was distinguished by the continued decline of Douglas fir prices and the rise of Southern pine for structural uses to new high levels. In these two respects the lumber market presents a departure

and car building markets were comparatively inactive but both yard buying and the export trade have been healthy, with the result that prices were saved from the depression that was feared in the spring.

The trend of lumber prices is disclosed by the tables and charts, the latter showing slight declines in the Southern pine car-lining prices as against an advance in pine stringers, but in general the trend of Southern pine is a



The Variation in Scrap Prices in the Last Six Years

from the general characteristics of the year. On the whole the year was definitely a buyer's market until within the last few months, although relatively stable conditions prevailed throughout. The explanation is found in certain conditions in the several markets affecting lumber prices. There are principally four of these markets, the retail market, the railroads, the car builders and the export trade. During the first half of the year the railroad

repetition on a slightly higher level of the trend in 1924, when prices receded gradually towards the middle of the year and then returned to former levels. Southern pine prices are much firmer now than earlier in the year. Contributing to this are the car orders placed within the last 60 days, together with the fact that production has been noticeably hampered by prolonged rains in the woods, necessitating the filling of orders from reserve stocks.

Locomotive Prices in 1925

Road	No.	Type	Weight	Cylinders	Builder	Unit Price	Total Approximate Cost	Order Placed	Equipment Trust Application Decided
Central of Georgia	10	2-8-2	300,500	27 x 36	Baldwin	\$49,435	\$494,350	1924	Mar. 2
	10	2-10-2	382,000	30 x 32	Baldwin	64,161	641,608	July, 1925	Nov. 7
	5	4-8-2	316,500	27 x 28	American	52,850	264,250	March, 1925	Nov. 7
Central of New Jersey	20	2-8-2	.....	27 x 32	Baldwin	53,465	1,069,299	Dec., 1924	Apr. 30
Chesapeake & Ohio	20	2-8-8-2	565,000	23 & 23 x 32	Baldwin	99,790	1,995,812	Sept., 1925	Dec. 12
	40	2-8-2	357,500	28 x 32	American	64,363	2,574,511	Sept., 1925	Dec. 12
	10	2-8-2	357,500	28 x 32	American	66,231	662,305	Sept., 1925	Dec. 12
	5	4-6-2	335,000	27 x 28	American	66,262	331,311	Oct., 1925	Dec. 12
Chic., Rock Island & Pac.	10	0-8-0	230,000	23 1/2 x 30	American	37,522	375,225	Feb., 1925	Aug. 18
	10	2-10-2	391,000	30 x 30	American	58,898	588,985	March, 1925	Aug. 18
Florida East Coast	12	4-8-2	318,000	26 x 28	American	65,403	784,836	Jan., 1925	Feb. 17
	6	0-8-0	216,000	25 x 28	American	41,618	249,708	Jan., 1925	Feb. 17
	15	2-8-2	297,000	26 x 30	American	43,221	648,315	July, 1925	July 11
	6	0-8-0	216,000	25 x 28	American	30,909	185,454	July, 1925	July 11
	10	4-8-2	318,000	26 x 28	American	61,415	614,150	Aug., 1925	Sept. 28
Great Northern	4	2-8-8-2	578,000	29 & 28 x 32	Baldwin	91,000	364,000	Dec., 1924	Jan. 8
Long Island	5	4-6-0	237,000	24 x 28	Penn. R. R.	37,502	185,510	April, 1924	May 6
Missouri Pacific	15	2-8-2	330,000	27 x 32	American	63,873	958,093	Dec., 1924	Feb. 25
	20	2-8-2	330,000	27 x 32	American	55,687	1,137,737	Dec., 1924	Feb. 25
	10	4-6-2	290,000	27 x 28	American	54,877	548,771	Dec., 1924	Feb. 25
	5	0-8-0	224,900	25 x 28	Baldwin	41,612	208,059	Dec., 1924	Feb. 25
New York, New Haven & Hartford	5	A.C. Elec. Frt.	.....	.....	Am.-Gen. Elec.	95,400	477,000	Oct., 1924	Jan. 29
	2	A.C. Elec. Sw.	120,000	.....	Am.-Gen. Elec.	89,000	178,000	Oct., 1924	Jan. 29
	2	D.C. Elec. Sw.	120,000	.....	West-Baldwin	33,795	67,590	Oct., 1924	Jan. 29
	9	4-8-2	334,000	27 x 30	American	60,250	545,639	1923	Jan. 29
	1	4-8-2	345,000	27 x 30	American	84,625	84,625	1923	Jan. 29
	5	0-8-0	216,000	25 x 28	American	40,400	203,883	1923	Jan. 29
Reading Company	10	0-8-0	245,000	22 x 28 (3 cyl.)	American	49,750	497,500	July, 1924	Jan. 29
	25	2-8-0	315,585	27 x 32	Baldwin	63,405	1,585,119	1923	Jan. 9
	10	4-6-2	.....	.....	.....	50,213	502,126	.....	Jan. 9
	5	0-8-0	280,610	26 x 32	Baldwin	49,841	249,203	March, 1924	Jan. 9
	25	2-8-0	.....	.....	Baldwin	56,447	1,411,175	Dec., 1924	Apr. 8
Southern Pacific	5	4-6-2	.....	.....	Baldwin	52,147	260,735	Dec., 1924	Apr. 8
	15	4-10-2	438,000	25 x 28 & 32 (3)	American	80,901	1,213,520	Dec., 1924	June 24
	18	4-8-2	.....	.....	.....	79,500	1,431,000	.....	June 24
	10	0-6-0	.....	.....	.....	36,623	366,230	.....	June 24
Seaboard Air Line	20	2-8-2	301,000	26 x 30	Baldwin	60,700	1,214,000	July, 1924	Jan. 20
	10	2-8-2	320,900	27 x 28	Baldwin	53,950	539,500	July, 1924	Jan. 20
	20	2-8-2	300,000	26 x 30	American	48,000	1,440,000	Apr., 1925	Dec. 17
	1	2-8-2	302,000	26 x 30	Baldwin	62,000	248,000	Aug., 1925	Dec. 17
	4	2-8-2	302,000	26 x 30	Baldwin	42,800	428,000	Apr., 1925	Dec. 17
	1	4-8-2	320,900	27 x 28	Baldwin	56,000	336,000	Aug., 1925	Dec. 17
Texas & Pacific	6	4-8-2	320,500	26 x 30	Baldwin	56,000	336,000	Aug., 1925	Dec. 17
	10	2-10-4	440,000	29 x 32	Lima	100,489	1,004,890	July, 1925	Aug. 31
	5	4-8-2	370,000	27 x 30	American	85,940	429,700	July, 1925	Aug. 31
	8	0-8-0	220,000	22 x 28	Baldwin	48,795	390,360	July, 1925	Aug. 31
	2	0-8-0	.....	.....	.....	62,265	124,530	July, 1925	Aug. 31

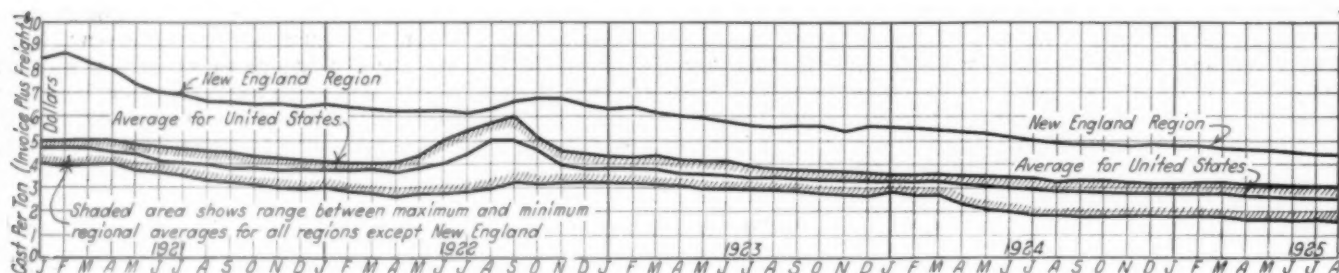
The reactionary effect upon labor of the large cotton crops in the south, will also promote advances in the prices in Southern pine, but in view of the repeated failures to sustain higher levels as well as the depressed condition of the fir market, it is improbable that 1926 will see a change in the general trend or levels, although advance prices are anticipated for the first few months of the year.

The fir market affords an accurate picture of the conditions in that industry during the year, when prices declined to the lowest level for several years. That these levels are as low as present economic conditions can justify is indicated by the number of shutdowns on the Pacific coast earlier in the year because the return was less than the cost of production. The fir market was adversely affected by a pronounced slump in retail buying on the Pacific coast and the diminished orders from railroads. The greater promptness with which car lumber can be transported to central markets, 21 days ordinarily being ample, has also proved a disadvantage to fir producers by encouraging buying in small quantities, a practice which makes it difficult for producers to anticipate future requirements. The impediments to rail transportation of pine to Florida to meet the demands of the boom conditions in building there has proved an aid to Pacific coast business. While there has not been much balancing be-

makes it impossible to hazard a specific forecast with reference to the range of prices during 1926, but in view of the present stiffening of prices in some localities and the enlarged programs of maintenance contemplated, it will not be surprising if the tie market will assume a slightly higher level.

Likelihood of Higher Coal Prices Remote

A suggestion of the coal situation is indicated in the chart of the costs to the railroads and of the spot prices throughout the year. Prices have been on a stable basis and have steadily declined. The anthracite strike has had practically no effect on railway coal prices. While necessitating large adjustments in the anthracite burning region, the effect of the strike apparently has been limited to an advance in the price of Pocahontas and other coals which are being substituted for it. It has also occasioned some increase in the price of fuel oil. Little fear is being entertained by railroads over the possibility of a sympathetic strike in the bituminous fields. This feeling of security is strengthened by the halting tendency of the market because of prolonged mild weather. On the whole the year has been marked by minimum reserve stocks and low prices for the railroads. While some advances in the prices of coal are observed the price of mine run con-



Price of Coal Purchased by Class I Roads as Reported by I. C. C. Bureau of Statistics

tween fir and pine it can be expected that fir prices will prove a stabilizer of pine prices in 1926.

Railroads Slow in Placing Tie Orders

A review of the cross-tie market indicates an appreciable cessation of the marked fluctuation in purchases which have characterized this field for many years. It was for a long time the practice of the railroads to enter and drop out of the market at about the same time, with the result that at periods of active buying the prices were inflated and of a character to foster departure from specification requirements. This evil is diminishing, however, with the pronounced increase in the use of treated ties. As treatment calls for several months' seasoning, considerable quantities of ties must be kept in storage at all times to protect the output of plants, a condition which tends toward a stabilization of the market. In general the tie industry has been in a better position in the past year than before, although railroads have been slow in placing orders for their requirements.

In the south good crops interfered with tie production, with a consequent stiffening of prices which was intensified within the last 60 days by heavy rains which affected all lumbering operations adversely. In view of this condition it is not surprising that the most recent quotations from this territory disclosed advances in prices. Such a condition does not prevail in the west, however, where no increase has taken place. While the roads have generally been sluggish in placing their orders for future requirements, many roads not only have their 1926 ties on hand but also a part of those for 1927. Absence of accurate figures on the relation of stock on hand to requirements

continues generally stable and not only do indications point to the continuation of existing trends well towards spring but there are predictions of price cutting as a means of moving more coal.

In the market of miscellaneous material there is much irregularity in trends, which is to be expected in view of the wide variety of commodities included in this category. At the present time the market discloses a tightness in the prices of crude oil while export demand is stiffening the prices in gasoline. The production of cement is now steady at prices which disclose a firmer tone over the market last fall when a reduction of prices became effective. The prices of brick, tile and other clay products also disclose a firmer tone, although it is questionable if the advances in prospect can be maintained.

Equipment Prices

The tables of locomotives, freight cars and passenger cars usually shown in the *Railway Age's* annual review of price trends are supplemented this year with a table and diagram showing equipment index prices from 1910 to 1924.

The regular tabulations of prices—as distinguished from this table and diagram of index numbers—include only such equipment as has been financed through issues of equipment trust certificates which were approved during 1925 by the Interstate Commerce Commission. The data are given in considerable detail. There are included the name of the road, details concerning the type and size of the equipment, the number of units, the price per unit, the name of the builders, the date of the order and the date on which approval of the equipment trust financ-

Freight Car Prices in 1925

Route	No.	Type	Capacity	Construction	Builder	Unit Price	Total Approximate Cost	Order Placed	Equipment Trust Application Decided
Baltimore & Ohio.....	2,000	Box	50-ton	Steel	Pullman	\$1,990	\$3,980,000	Jan., 1925	May 11
	2,500	Gondola	70-ton	Steel	Std. Steel	2,086	5,215,625	Jan., 1925	May 11
	500	Gondola	70-ton	Steel	Gen'l Am.	2,058	1,028,885	Jan., 1925	May 11
Central of Georgia.....	300	Vent. Box	40-ton	St. Unf.	Tenn. C. I. & R. R.	2,180	654,000	Nov., 1924	Mar. 2
	200	Vent. Box	40-ton	St. Unf.	Tenn. C. I. & R. R.	2,149	429,704	Nov., 1924	Mar. 2
	100	Flat	40-ton	St. Unf.	Tenn. C. I. & R. R.	1,449	144,880	Nov., 1924	Mar. 2
	1,927	Vent. Box	40-ton	Wood	Tenn. C. I. & R. R.	2,200	4,239,830	July-Oct., 1925	Nov. 7
Central of New Jersey.....	25	Air Dump	30-yd.	.....	Magor	4,500	112,500	Nov., 1924	Apr. 30
Chesapeake & Ohio.....	100	Caboose	.....	St. Frame	Std. Steel	2,457	245,724	Sept., 1925	Dec. 12
	4	Air Dump	.....	.....	.....	3,081	12,324	.....	Dec. 12
Chicago & North Western.....	500	Box	40-ton	St. Unf.	Pressed Steel and Bet-	1,996	998,055	Nov. 1924	Sept. 12
	500	Box	40-ton	St. Unf.	tendorf.	2,011	1,005,590	Nov. 1924	Sept. 12
	500	Auto. Box	40-ton	St. Unf.	Pressed Steel and	2,056	1,028,025	Nov. 1924	Sept. 12
	500	Auto. Box	40-ton	St. Unf.	Am. Car & Fdy.	2,055	1,027,315	Nov. 1924	Sept. 12
	500	Flat	50-ton	St. Unf.	Std. Steel	1,539	769,405	Nov. 1924	Sept. 12
	200	Refrig.	40-ton	St. Unf.	Am. Car & Fdy.	2,955	590,956	Nov. 1924	Sept. 12
	500	Stock	40-ton	St. Unf.	Ill. Car & Mfg.	1,794	896,820	Nov. 1924	Sept. 12
Chic., Ind. & Louisville.....	500	Box	40-ton	St. Ctr. Sills	Pullman	1,897	948,500	March, 1925	May 15
	250	Hopper	55-ton	St. Unf.	Pullman	1,821	455,375	March, 1925	May 15
Chicago, Milwaukee & St. Paul.....	1,000	Box	40-ton	St. Frame	Bettendorf	.....	.....	May, 1925	Sept. 12
	1,000	Box	40-ton	St. Frame	Pressed Steel	1,986	5,957,680	May, 1925	Sept. 12
	1,000	Box	40-ton	St. Frame	Pullman	.....	.....	May, 1925	Sept. 12
	500	Auto.	40-ton	St. Frame	Am. Car & Fdy.	2,093	2,093,105	May, 1925	Sept. 12
	500	Auto.	40-ton	St. Frame	Gen'l Am.	.....	.....	May, 1925	Sept. 12
	1,000	Stock	40-ton	St. Frame	Std. Steel	1,759	1,759,410	May, 1925	Sept. 12
	500	Stock	40-ton	St. Frame	Ill. Car & Mfg.	1,774	887,100	May, 1925	Sept. 12
	500	Flat	50-ton	St. Frame	Ryan	1,486	742,850	May, 1925	Sept. 12
	500	Gondola	50-ton	Composite	Std. Tank	1,835	919,385	May, 1925	Sept. 12
Chic., Rock Island & Pac.....	1,200	Box	40-ton	St. Unf.	Am. Car & Fdy.	2,091	2,509,080	March, 1925	Aug. 18
	400	Coal	50-ton	Composite	Am. Car & Fdy.	2,241	896,310	March, 1925	Aug. 18
Florida East Coast.....	20	Caboose	.....	St. Unf.	Magor	4,315	86,300	Dec., 1924	Feb. 17
Georgia, Florida & Alabama.....	280	Box	40-ton	St. Unf.	Gen'l Am.	1,959	548,436	Sept., 1925	Dec. 1
Great Northern	500	Ore	75-ton	Steel	Bethlehem Steel	1,950	975,000	Oct. 1924	Jan. 8
	900	Auto. Box	50-ton	St. Frame	Gen'l-Am.	2,300	2,070,000	Oct. 1924	Jan. 8
	100	Auto. Box	50-ton	St. Frame	Co. shops	1,900	190,000	1924	Jan. 8
	600	Box	50-ton	St. Frame	Co. shops	1,800	1,080,000	1924	Jan. 8
	500	Stock	30-ton	Wood	Siems-Stemmel	1,450	725,000	Jan., 1924	Jan. 8
	20	Tank	12,500-g.	Steel	Std. Tank Car	2,050	41,000	Sept., 1924	Jan. 8
	25	Caboose	.....	St. Unf.	.....	1,920	48,000	.....	Jan. 8
	40	Dump	30-yd.	Steel	Pressed Steel	3,500	140,000	Nov., 1924	Jan. 8
Illinois Central	500	Auto. Box	40-ton	St. Frame	500 Pullman and	2,225	1,112,500	Sept., 1925	Dec. 12
	500	Auto. Box	40-ton	St. Frame	500 Am. Car & Fdy.	2,227	1,113,500	Sept., 1925	Dec. 12
	200	Flat	50-ton	St. Frame	Std. Steel	1,770	354,000	Oct., 1925	Dec. 12
	200	D. D. Stock	40-ton	St. Frame	Gen'l Am.	1,990	398,000	Oct., 1925	Dec. 12
Longview, Portland & Northern.....	50	Logging	.....	.....	.....	1,778	88,886	.....	May 7
Minn., St. Paul & S. Ste. Marie.....	125	Ore	75-ton	Steel	Pullman	.....	.....	Feb., 1925	May 6
	125	Ore	75-ton	Steel	Am. Car & Fdy.	2,299	574,875	Feb., 1925	May 6
Missouri Pacific	800	Auto. Box	40-ton	St. Unf.	Am. Car & Fdy.	2,051	1,640,920	Dec., 1924	Feb. 25
	200	Auto. Box	50-ton	St. Unf.	Am. Car & Fdy.	2,627	525,414	Dec., 1924	Feb. 25
	40	Caboose	.....	St. Unf.	Am. Car & Fdy.	2,525	101,017	Dec., 1924	Feb. 25
	1,000	Box	40-ton	St. Unf.	Am. Car & Fdy.	1,961	3,921,255	Dec., 1924	Feb. 25
	1,000	Box	40-ton	St. Unf.	Gen'l-Am.	.....	.....	Dec., 1924	Feb. 25
	375	Gondola	50-ton	St. Unf.	Pullman	1,936	1,451,933	Dec., 1924	Feb. 25
	375	Gondola	50-ton	St. Unf.	Penn. Car	1,846	276,928	Dec., 1924	Feb. 25
	150	Hopper	55-ton	Steel	Std. Steel	1,858	185,850	Dec., 1924	Feb. 25
	100	Hopper	55-ton	Steel	Std. Steel	1,858	185,850	Dec., 1924	Feb. 25
New York Central.....	500	Box	55-ton	Steel	.....	2,246	1,123,240	.....	May 16
	400	Box	55-ton	Steel	.....	2,244	897,600	.....	May 16
	100	Box	55-ton	Steel	.....	2,138	213,791	.....	May 16
	200	Refrig.	35-ton	.....	.....	3,122	624,400	.....	May 16
Norfolk & Western.....	1,000	Auto. Box	50-ton	St. Frame	Std. Steel	2,400	2,400,000	Sept., 1924	Dec. 30, '24
	3,000	Gondola	62½-ton	Steel	{ Ralston, Pressed Steel, Newport News or Va Br & I. }	1,750	5,250,000	Nov., 1924	Dec. 30, '24
Northern Pacific	800	Gondola	.....	.....	Ryan	1,894	1,515,472	Dec., 1924	May 26
	500	Box	.....	.....	{ Pullman and	2,008	1,003,780	Jan., 1925	May 26
	500	Box	.....	.....	{ Pac. Car & Fdy.	2,263	1,131,590	Jan., 1925	May 26
Reading Company	274	Gondola	70-ton	Steel	.....	1,974	540,904	.....	Jan. 9
	5	Well	.....	.....	.....	8,900	44,500	.....	Jan. 9
	50	Stock	.....	St. Frame	Std. Steel	2,157	107,842	Jan., 1924	Jan. 9
	400	Hopper	70-ton	Steel	Pressed Steel	.....	.....	Jan., 1924	Jan. 9
	200	Hopper	70-ton	Steel	Std. Steel	2,725	2,724,640	Jan., 1924	Jan. 9
	200	Hopper	70-ton	Steel	Bethlehem	.....	.....	Jan., 1924	Jan. 9
	200	Hopper	70-ton	Steel	Am. Car & Fdy.	4,600	46,000	.....	Jan. 9
	10	Caboose	.....	Steel	Pressed Steel	2,271	2,271,365	Sept., 1924	Apr. 8
	500	Gondola	70-ton	Steel	Bethlehem	.....	.....	Sept., 1924	Apr. 8
	500	Gondola	70-ton	Steel	Am. Car & Fdy.	2,186	2,185,600	Sept., 1924	Apr. 8
	500	Box	50-ton	Steel	Std. Steel	2,396	2,396,480	Oct. 1924	Apr. 8
	1,000	Hopper	70-ton	Steel	Bethlehem	.....	.....	Oct. 1924	Apr. 8
St. Louis Southwestern.....	1,000	Box	40-ton	St. Unf.	Mount Vernon	2,044	2,044,000	Dec., 1924	Feb. 14
Southern Pacific	2,796	Box	.....	St. Unf.	2,000 Std. Steel	2,358	6,592,301	.....	June 24
	200	Auto. Box	.....	St. Unf.	Std. Steel	2,762	552,400	.....	June 24
	1,000	Gondola	.....	Steel	Tenn. C. I. & R. R.	2,054	2,054,000	.....	June 24
	200	Tank	.....	.....	Penn. Car Co.	2,302	460,400	.....	June 24
	400	Ballast	.....	.....	Rodger Ballast	2,060	824,000	.....	June 24
	70	Caboose	.....	.....	.....	3,128	218,968	.....	June 24
Seaboard Air Line.....	10	Caboose	.....	St. Unf. New	Am. Car & Fdy.	3,545	35,450	.....	Jan. 20
	30	Caboose	.....	St. U. Reblt. T'ks	.....	3,000	240,000	.....	Jan. 20
	250	Caboose	.....	St. Unf.	Newport News	2,785	83,550	Aug. 1925	Dec. 17
Texas & Pacific	700	Gondola	50-ton	Steel	Western Steel	1,791	1,253,357	Aug., 1925	Aug. 31
	50	Gondola	50-ton	Steel	Western Steel	2,148	107,413	Aug., 1925	Aug. 31
Western Fruit Express.....	350	Refrig.	30-ton	St. Unf.	Co. shops	2,400	840,000	Dec., 1924	Jan. 20

RAILWAY EQUIPMENT FACTORS

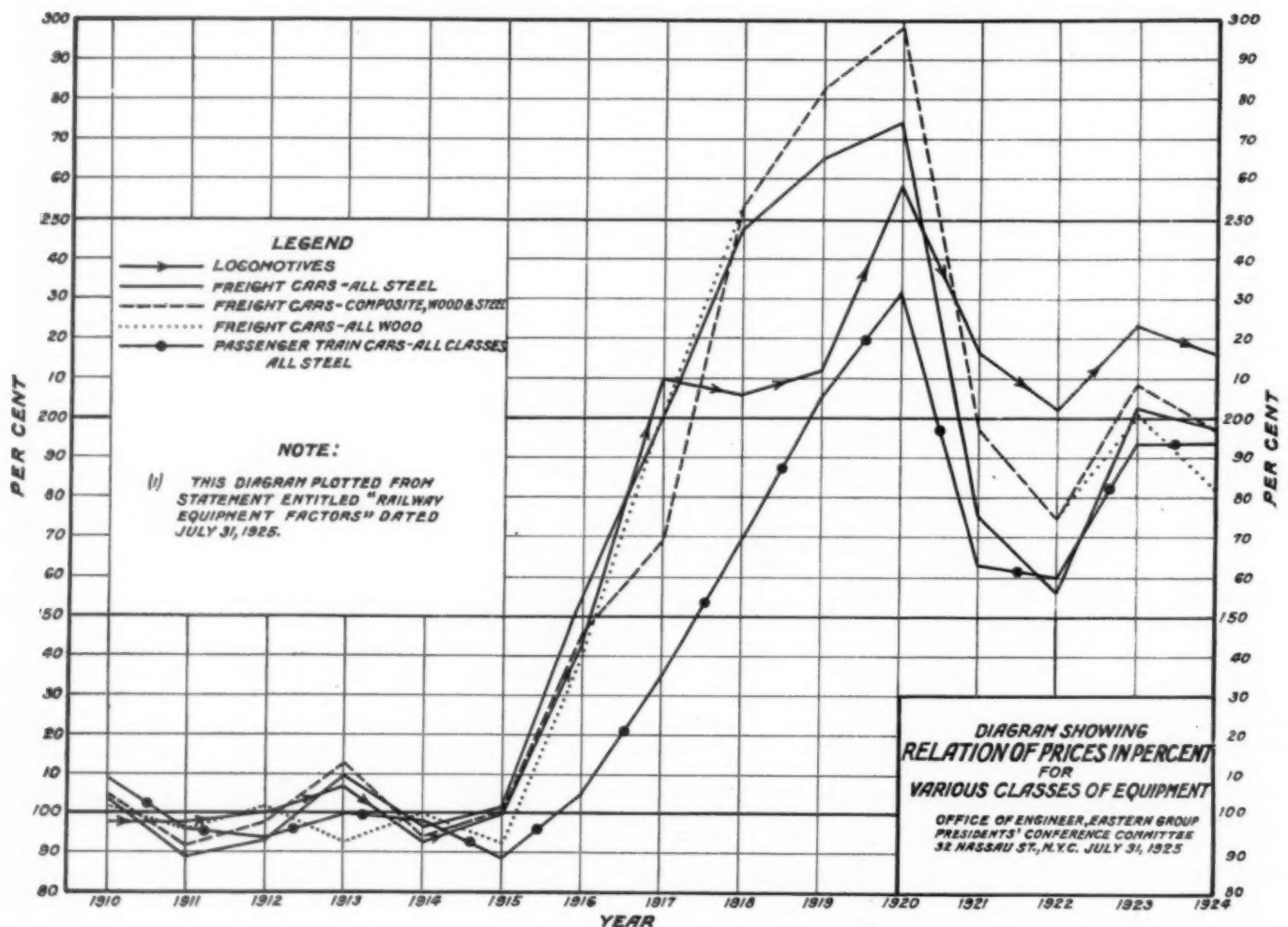
STATEMENT

SHOWING THE NUMBER OF UNITS SOLD; THE WEIGHTED AVERAGE PRICE PER POUND AS SOLD (EXCEPT WHERE ESTIMATED, SEE NOTE NO. 4)
AND THE PERCENT OF INCREASE IN PRICE.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
YEAR OR PERIOD	LOCOMOTIVES			FREIGHT CARS									ALL STEEL PASSENGER TRAIN CARS (STEEL UNDERFRAME AND ALL WOOD CARS - See Note 4-c)		FLOATING EQUIPMENT 1914-1924
	NO. OF LOCOMO.	PRICE PER LB.	PERCENT	ALL STEEL			COMPOSITE WOOD AND STEEL			ALL WOOD			NO. OF CARS	PERCENT	
				NO. OF CARS	PRICE PER LB.	PERCENT	NO. OF CARS	PRICE PER LB.	PERCENT	NO. OF CARS	PRICE PER LB.	PERCENT			
1910-1914, INCL. BASE	10,885	7.585	100	71,108	2.574	100	148,047	2.514	100	53,349	2.264	100	4,116	100	-
1910	2,901	7.585	98	10,455	2.68	104	19,865	2.63	105	13,739	2.30	102	799	109	86
1911	1,606	7.516	98	13,880	2.90	89	32,918	2.31	92	13,720	2.17	94	508	96	89
1912	3,269	7.860	100	17,808	2.89	93	46,346	2.47	98	17,665	2.31	102	821	96	93
1913	2,066	7.890	107	22,898	2.83	110	25,999	2.54	112	2,600	2.11	92	1,212	100	96
1914	799	6.873	93	8,402	2.49	97	24,338	2.37	94	5,625	2.25	100	776	98	100
1915	981	7.413	100	13,080	2.63	102	34,782	2.54	101	4,380	2.11	93	396	89	107
1916	2,170	10.842	143	21,307	4.01	156	14,650	3.67	146	12,296	2.19	141	687	105	125
1917	1,586	15.513	210	4,780	5.11	199	14,500	4.22	169	3,200	4.54	201	548	136	164
1918	1,976	15.328	206	12,383	6.36	247	43,000	6.36	253	None	5.72	252	16	189	227
1919	275	15.637	212	None	5.82	252	None	7.02	282	None	5.37	232	31	105	245
1920	1,428	19.074	258	13,480	7.03	274	12,950	7.47	298	None	6.72	252	643	231	239
1921	586	18.923	216	4,200	4.80	176	12,450	4.94	197	None	4.46	197	47	163	200
1922	1,910	14.924	208	22,181	4.00	156	51,897	4.39	175	None	3.25	175	1,182	160	175
1923	1,726	16.881	224	19,875	5.81	208	26,140	5.24	209	4,800	4.54	201	407	194	170
1924	1,109	15.919	216	46,433	5.06	196	26,300	4.92	196	3,795	4.12	182	862	194	

NOTES:

- (1) The data on rolling equipment is based on the total selling price of the entire output of two large locomotive and six large car companies with certain sales excluded such as the Farming locomotives and locomotives and cars sold to foreign countries.
- (2) The percentages on floating equipment are based on trend of prices as furnished by five large shipbuilding companies.
- (3) The price per pound is a weighted average composite price of all classes of equipment coming under each of the general headings.
- (4) All prices and percentages shown in above table were determined from actual data furnished by the manufacturers with the exception of those underlined which were estimated in the following manner:
 - (a) ALL STEEL FREIGHT CARS, COMPOSITE FREIGHT CARS - Price and percentage for 1919 were derived by interpolating between actual prices reported for 1918 and 1920 (1st 6 mos.)
 - (b) ALL WOOD FREIGHT CARS - The percentages for composite cars were used and from these percentages the price per pound was calculated using the weighted average price of all wood freight cars for 1910 to 1914, incl., as base, or 100%.
 - (c) ALL STEEL PASSENGER TRAIN CARS, FLOATING EQUIPMENT - Derived by interpolating between "Trend of Price" factors shown in Equipment Committee's reports (Passenger Train Car Report, dated June 1, 1921, and Supplement, and Floating Equipment Report, dated Dec. 30, 1920 and Supplement).
 - (d) WOOD WITH STEEL UNDERFRAME AND ALL WOOD PASSENGER TRAIN CARS - No sales reported (except five for Steel Underframe) 1915 to 1918, incl. If sufficient wooden cars had been sold to make the market, it is felt that the increase in price over the weighted average price 1910 to 1914, incl., would have been at least as great as that for all steel cars; therefore the percentage factors shown for all steel passenger train cars (Col. 15) are recommended for application to the wood with steel underframe and all wood passenger train cars.



ing was granted. The name of the purchaser, the number of units of each type and the prices are obtained from the Interstate Commerce Commission finance dockets. The other material is supplied by the *Railway Age* from its own equipment tabulations.

It will be noted that the selection of material is based

INDEX NUMBERS OF EQUIPMENT PRICES			
	Average 1910-1914	1923	1924
Locomotives	100	224	216
Freight Cars:			
All-Steel	100	203	196
Composite, wood and steel.....	100	209	196
All-wood	100	201	182
Passenger Train Cars.....	100	194	194

on the date on which approval of the equipment financing was granted. Much of the equipment in the list was ordered in 1924 or even in 1923. The recognized security of the equipment trust and its increasing popularity have in recent years permitted greater liberality than formerly ruled; the custom of financing equipment through equipment trusts issued a year, two years or even more after the equipment has been received is a new phase.

The information relative to the index numbers of equipment prices shows nearly double those ruling before the war.

The table and diagram of equipment prices are taken from a pamphlet issued by the equipment committee of the Presidents' Conference Committee on Federal Valuation. These prices and indexes are figured on a per pound basis of the simple or standard locomotive or car, and do not include the specialties. In other words, as distinguished from the tables of prices taken from the Interstate Commerce Commission finance dockets, they do not reflect the increase in the size of the equipment nor the increasing complexities of its design in the period which has been covered.

The equipment committee prepared studies of the cost of locomotives, freight cars and passenger cars some years ago. The information here used is from a supplement to the original study. Detailed descriptions of the methods followed in compiling the information will be found in the two following articles: "The Cost of Locomotive for Valuation Purposes," *Railway Age* of September 3, 1920, and "The Cost of Reproduction New of Steel Freight Cars," *Railway Age* of March 11, 1921.

PASSENGER CAR PRICES IN 1925

Road	No.	Class	Construction	Length	Weight	Builder	Unit Price	Total approximate Cost	Order Placed	Equipment Trust Application Decided
Baltimore & Ohio.....	1	Dining	Steel	79 ft.	169,000	Pullman	\$53,165	\$53,165	July, 1925	May 11
	4	Dining	Steel	79 ft.	169,000	Pullman	48,165	192,661	July, 1925	May 11
	10	Elec. Coaches	Steel	67 ft.	95,750	Std. Steel	21,375	213,750	April, 1925	May 11
	10	Coaches	Steel	67 ft.	90,000	Std. Steel	19,275	192,750	April, 1925	May 11
Central of Georgia.....	3	Comp Coaches	Steel	79 ft.	.....	Pullman	30,215	90,645	Dec., 1924	Mar. 2
	2	Comp Coaches	Steel	79 ft.	139,100	Pullman	30,716	61,432	Dec., 1924	Mar. 2
	1	Bagg. & Mail	Steel	74 ft.	.....	Pullman	27,356	27,356	Dec., 1924	Mar. 2
Central of New Jersey.....	23	Coaches	Steel	.....	.....	Std. Steel	23,281	535,465	Dec., 1924	Apr. 30
	5	Pass. & Bagg.	Steel	.....	.....	Bethlehem Ship ..	22,294	111,470	Dec., 1924	Apr. 30
	2	Club	Steel	.....	.....	Bethlehem Ship ..	27,541	55,082	Dec., 1924	Apr. 30
Chesapeake & Ohio.....	10	Pass. & Bagg.	Steel	75 ft.	141,000	Bethlehem Ship ..	26,940	269,401	Oct., 1925	Dec. 12
	3	Postal	Steel	63 ft.	130,000	Bethlehem Ship ..	28,037	84,110	Nov., 1925	Dec. 12
Chicago & North Western.....	24	Coaches	Steel	54 ft.	113,000	Am. Car & Fdy. ..	20,050	481,211	Dec., 1924	Sept. 12
	12	Baggage	Steel	60 ft.	120,680	Am. Car & Fdy. ..	16,296	195,573	Dec., 1924	Sept. 12
	11	Baggage	Steel	60 ft.	120,680	Pullman	16,221	178,436	Dec., 1924	Sept. 12
	3	Bagg. & Mail	Steel	70 ft.	137,000	Am. Car & Fdy. ..	21,448	64,344	.....	Sept. 12
Chic., Rock Island & Pac.....	5	Bagg. & Mail	Steel	70 ft.	.....	Std. Steel	24,000	120,000	March, 1925	Aug. 18
	2	Bagg. & Buff.	Steel	75 ft.	.....	Pullman	52,624	105,248	May, 1925	Aug. 18
Florida East Coast.....	12	Coaches	Steel	.....	.....	Pullman	30,125	361,500	Dec., 1924	Feb. 17
	1	Dining	Steel	.....	.....	Pullman	48,500	48,500	Dec., 1924	Feb. 17
	15	Coaches	Steel	70 ft.	142,300	Pullman	30,690	460,351	May, 1925	July 11
	15	Baggage	Steel	70 ft.	133,400	Pullman	23,375	350,625	May, 1925	July 11
	2	Dining	Steel	74 ft.	155,700	Pullman	48,500	97,000	March, 1925	July 11
	20	Coaches	.....	.....	.....	Second-hand	17,000	340,000	Aug., 1925	Sept. 28
Georgia, Florida & Alabama...	3	Coaches	Steel	.....	.....	Bethlehem Ship ..	26,174	78,521	Sept., 1925	Dec. 1
	3	Pass. & Mail	Steel	.....	.....	Bethlehem Ship ..	25,924	77,771	Sept., 1925	Dec. 1
	2	Bagg. & Exp.	Steel	.....	.....	Bethlehem Ship ..	18,588	37,175	Sept., 1925	Dec. 1
Illinois Central	130	Sut. Motor	Steel	72 ft.	125,000	Pullman	49,250	6,402,500	Nov., 1924	Dec. 12
	85	Trailer	Steel	72 ft.	84,000	Std. Steel	25,600	2,176,000	Nov., 1924	Dec. 12
Long Island	40	Elec. Motor	Steel	63 ft.	114,705	Am. Car & Fdy.	29,813	1,192,520	Oct., 1924	May 6
Missouri Pacific	2	Dining	Steel	82 ft.	158,250	Am. Car & Fdy.	42,694	85,388	Jan., 1925	Feb. 25
	1	Pass. & Mail	Steel	70 ft.	145,000	Am. Car & Fdy.	29,416	29,416	Jan., 1925	Feb. 25
	10	Mail Storage	Steel	70 ft.	129,000	Am. Car & Fdy.	18,083	180,832	Jan., 1925	Feb. 25
	2	Baggage	Steel	70 ft.	129,000	Am. Car & Fdy.	18,168	36,336	Jan., 1925	Feb. 25
	8	Baggage	Steel	70 ft.	129,000	Am. Car & Fdy.	18,193	145,545	Jan., 1925	Feb. 25
	9	Mail & Bagg.	Steel	73 ft.	124,800	Pullman	22,869	205,823	Jan., 1925	Feb. 25
	6	Coaches	Steel	79 ft.	142,300	Pullman	26,792	160,753	Jan., 1925	Feb. 25
New York Central.....	29	Motor Pass.	Steel	68 ft.	130,700	Std. Steel	39,101	1,133,927	March, 1925	May 16
	10	Dining	Steel	81 ft.	170,000	Pullman	49,587	495,875	March, 1925	May 16
	10	Coaches	Steel	78 ft.	132,200	Pressed Steel	27,625	276,251	March, 1925	May 16
	15	Baggage	Steel	63 ft.	111,000	Std. Steel	18,599	278,990	March, 1925	May 16
N. Y., New Haven & Hartford.	1	Gas. Elec.	.....	62 ft.	70,000	J. G. Brill Co.	34,000	34,000	Sept., 1924	Jan. 29
	10	Elec. Motor	Steel	72 ft.	120,000	Pressed Steel	47,009	470,093	March, 1924	Jan. 29
	3	Elec. Motor	Steel	72 ft.	175,500	Osgood-Bradley ..	63,400	190,200	.....	Jan. 29
	10	Gas. Motor	.....	.....	.....	{ 10 Sykes and.....	20,000	200,000 }	Feb., 1924 and {	Jan. 29
	10	Gas. Motor	.....	.....	.....	{ 10 Brill	19,500	195,000 }	Sept., 1924 }	Jan. 29
Northern Pacific.....	10	Coaches	.....	.....	.....	Pullman	28,947	289,475	Dec., 1924	May 26
	5	Mail & Bagg.	Steel	73 ft.	138,900	Pullman	24,311	121,557	Dec., 1924	May 26
	5	Baggage	.....	.....	.....	Pullman	20,068	100,341	Dec., 1924	May 26
	10	Observation	.....	.....	.....	Pullman	55,000	550,000	March, 1925	May 26
Reading Company	120	Sub. Suburban	Steel	70 ft.	109,000	Bethlehem Ship ..	21,785	2,614,151	1922, '23 & '24	Jan. 9
	10	Sub. Pass. & Bagg.	Steel	72 ft.	109,000	Bethlehem Ship ..	20,908	627,244	1922 & '23	Jan. 9
	20	Pass. & Bagg.	Steel	72 ft.	109,000	Std. Steel	16,848	168,480	1924	Jan. 9
	10	Baggage	Steel	67 ft.	107,400	Am. Car & Fdy.	16,860	33,719	1922 & '23	Jan. 9
	1	Gas Motor	Steel	.....	.....	Brill .....	.....	.....	.....	.....
	1	Gas Motor	Steel	.....	.....	Service .....	.....	.....	.....	.....
	1	Business	Steel	.....	.....	Bethlehem Ship ..	84,104	84,104	1922	Jan. 9
	10	Pass. & Bagg.	Steel	72 ft.	109,000	Bethlehem Ship ..	19,834	198,341	1924	Apr. 8
	5	Bagg. & Mail	Steel	63 ft.	114,420	Am. Car & Fdy. }	19,250	192,500	1925	Apr. 8
	5	Bagg. & Mail	Steel	63 ft.	114,420	Bethlehem Ship. }	.....	.....	.....	.....
	10	Baggage	Steel	67 ft.	107,400	Am. Car & Fdy.	16,826	168,263	1924	Apr. 8
	1	Gas. Elec. Motor	Steel	.....	.....	.....	38,500	38,500	.....	Apr. 8
Seaboard Air Line.....	6	Express	Steel	.....	.....	Am. Car & Fdy.	20,425	122,550	Aug., 1924	Jan. 20
	6	Pass. & Bagg.	Steel	.....	.....	Am. Car & Fdy.	27,010	162,060	Aug., 1924	Jan. 20
	6	Bagg. & Mail	Steel	.....	.....	Am. Car & Fdy.	21,740	130,440	Aug., 1924	Jan. 20
	2	Gas. Elec.	.....	.....	.....	.....	52,000	104,000	.....	Jan. 20
	12	Dining	Steel	79 ft.	156,500	Pullman	41,986	503,832	June, 1925	Dec. 17
	3	Bagg. & Mail	Steel	.....	.....	Am. Car & Fdy.	23,950	47,900	Aug., 1925	Dec. 17
	2	Bagg. & Mail	Steel	.....	.....	Am. Car & Fdy.	23,344	46,688	Aug., 1925	Dec. 17
Southern Pacific	6	Bagg. & Mail	Steel	70 ft.	.....	Std. Steel	24,971	149,826	.....	June 24
	6	Bagg. & Horse	Steel	70 ft.	.....	Am. Car & Fdy.	23,659	141,954	Feb., 1924	June 24
	1	Dynamometer	.....	57 ft.	.....	Std. Steel	63,500	63,500	1924	June 24
	6	Elec. Motor	.....	.....	.....	.....	40,000	240,000	Apr., 1924	June 24

Dividend Changes on Stocks in 1925

Improved financial condition reflected in number of roads paying increased dividends

By Charles W. Foss

MOST of the changes made in dividend rates on railway stocks during 1925 were increases. The improved earnings of the carriers combined with the willingness and ability of the boards of directors to distribute the increased earnings to shareholders has had the effect of making railway shares more popular in the market than they have been for several years; the effect has also been in several instances to carry the prices on shares of some of the more prosperous carriers to figures that ruled prior to the war. In spite of this fact, however, there has been no important change with reference to the financing of railway needs through the issue of stock. It is expected in many quarters, however, that the carriers may be able to accomplish such financing in the near future, provided, of course, the present favorable condition continues. A tabulation of the important dividend changes of the year follows:

Akron, Canton & Youngstown. An initial quarterly dividend of \$4 per share was paid October 1 on the outstanding \$1,500,000 common stock.

Alabama & Vicksburg. This company has paid annual dividends of 7 per cent from 1916 to 1924. In April, 1925, directors declared a dividend of 5 per cent. In May, the company announced a stock dividend of 100 per cent represented by 21,000 shares of \$100 par value and payable to stockholders of record January 2. In September, directors declared a semi-annual dividend of 3 per cent on the increased capitalization payable October 1.

Atchison, Topeka & Santa Fe. In January, the directors declared a quarterly dividend of $1\frac{3}{4}$ per cent on the common stock, payable March 2. This placed the common stock on a 7 per cent annual basis as compared with the 6 per cent annual rate paid since 1910.

Buffalo & Susquehanna. This was one of the few companies that decreased its dividend disbursement during 1925. On November 30, it declared a dividend of three-quarters of one per cent, payable December 30, in place of the regular $1\frac{3}{4}$ per cent. The company has been paying regular dividends at the annual rate of 7 per cent since 1917. In 1922 and 1923 it declared extra dividends of 10 per cent, and in 1924 stockholders received an extra disbursement of $2\frac{1}{2}$ per cent.

Buffalo, Rochester & Pittsburgh. Decreased production of coal in the union coal mines served by this carrier compelled the directors in February to defer action on the regular 2 per cent semi-annual dividend paid since 1919. In July, however, the dividend was resumed, payable August 15, and in November an additional 2 per cent was declared, payable December 15, thereby completing the usual 4 per cent for the year.

Chicago, St. Paul, Minneapolis & Omaha. The directors in May deferred action on the regular semi-annual dividend of $3\frac{1}{2}$ per cent. In November, they declared a dividend of 5 per cent payable December 31. The preferred stock is 7 per cent non-cumulative. In 1924, it received total payments at $8\frac{1}{2}$ per cent.

Cincinnati Northern. Directors of this company, nearly all the stock of which is owned by the Cleveland, Cincinnati, Chicago & St. Louis, in February declared a dividend of 5 per cent, payable March 2, and on August 1 stockholders received an additional 5 per cent, making the total of 10 per cent for the year. The company, in 1923 and in 1924, paid semi-annual dividends of 3 per cent.

Cleveland, Cincinnati, Chicago & St. Louis. In December, directors increased the quarterly dividend rate from $1\frac{1}{4}$ to $1\frac{3}{4}$ per cent. Dividends at the annual rate of 5 per cent have been paid only since March, 1924. No dividends were paid from 1911 until 1922 when a 4 per cent rate was established. At the end of 1924, the New York Central owned 91 per cent of the Big Four common stock.

Gulf, Mobile & Northern. This company's 6 per cent preferred stock became cumulative on January 1, 1920. An initial dividend of 1 per cent was paid November 15, 1923, and a similar amount on February 15, 1924. In May, August and November, 1924,

dividends of $1\frac{1}{4}$ per cent were paid, and in February, May and August, 1925, $1\frac{1}{2}$ per cent was paid. In December, the directors declared an additional $4\frac{1}{4}$ per cent on the preferred stock, payable January 1. Of this dividend $\frac{3}{4}$ of one per cent was to be considered an adjustment of the regular 6 per cent dividend to January 1, 1925, this covering a change in the dividend date from November 15 to January 1. This makes the total of the regular dividends $6\frac{3}{4}$ per cent for 1925. The remaining $3\frac{1}{2}$ per cent of the recently declared dividend was to be charged against accumulations on the preferred stock, which on January 1 were 20 per cent.

Louisville, Henderson & St. Louis. An initial dividend of 2 per cent on this company's common stock, 85 per cent of which is owned by the Louisville & Nashville, was paid on September 15.

Maine Central. Holders of this company's 5 per cent cumulative preferred stock received no dividends between September, 1920, and December 1, 1924. On the latter date the regular quarterly dividends of $1\frac{1}{4}$ per cent were resumed and were paid regularly in 1925. In addition, two payments of $2\frac{1}{2}$ per cent were made, one in June and one in October, 1925, and in December directors declared a dividend of \$7.50, payable January 15, further applying on the accumulations. The effect of the last payment was to reduce the accumulations on the preferred stock to \$7.50.

Michigan Central. Dividends have been paid at the semi-annual rate of 10 per cent since July, 1923. In December, 1925, directors declared an extra dividend of $7\frac{1}{2}$ per cent payable January 29, 1926. The New York Central owns 95 per cent of the outstanding Michigan Central stock.

Mobile & Ohio. Stockholders received on December 30 an extra dividend of 3 per cent in addition to the regular semi-annual dividend of $3\frac{1}{2}$ per cent. From 1910 to 1922, the company paid regular dividends of 4 per cent, and in 1923 and 1924 it paid 7 per cent.

New York, Ontario & Western. Dividends of 1 per cent were paid in August, 1919, and April, 1920, and 2 per cent in October, 1921. In January, 1925, 1 per cent was paid covering the dividend for 1924. In December, directors deferred action on the 1925 dividend due to loss of income as a result of the anthracite coal strike.

Richmond, Fredericksburg & Potomac. In December, directors declared an extra dividend of 5 per cent on the \$1,316,900 voting common stock in addition to the regular annual dividend of 7 per cent. In 1923 and 1924, the regular annual dividends were paid.

St. Louis-San Francisco. Dividends were inaugurated on this company's common stock at the rate of 5 per cent annually on January 15, 1925. On September 2, the directors declared a quarterly dividend of $1\frac{3}{4}$ per cent, payable October 1, thereby increasing the rate to 7 per cent.

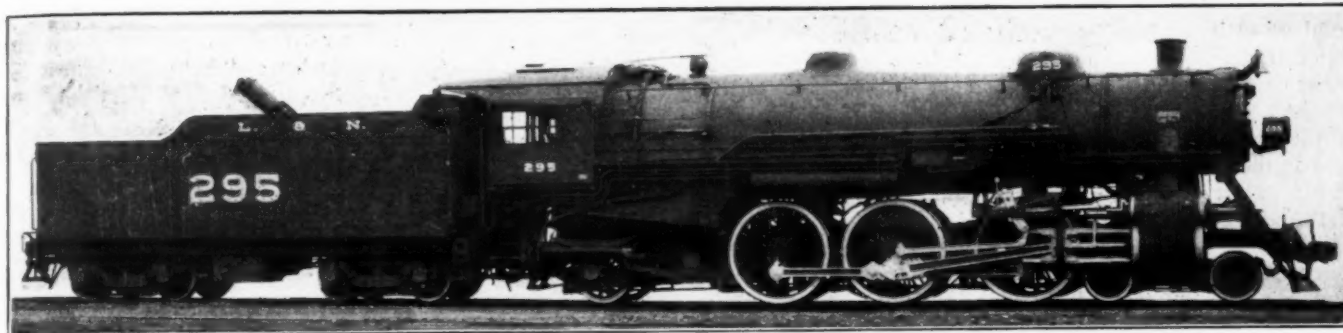
Southern Railway. Directors on December 10 declared a quarterly dividend of $1\frac{3}{4}$ per cent, making the annual rate 7 per cent. The company initiated dividends on its common stock in May, 1924, at an annual rate of 5 per cent.

Toronto, Hamilton & Buffalo. This company, which is controlled jointly by the New York Central and the Canadian Pacific, in December declared a 20 per cent stock dividend and a cash dividend of 6 per cent, both payable December 31. The company paid 6 per cent dividends from 1919 to 1923, except that no disbursements were made in 1920 nor in 1924.

Virginian. In December, an annual dividend of 6 per cent on the common stock was declared as compared with the annual dividends of 4 per cent in 1923 and in 1924.

Wabash. In March, directors declared a quarterly dividend of $1\frac{1}{4}$ per cent on the Class A preferred stock. An initial dividend on this stock was paid on January 29, 1917, and was continued quarterly to April 30, 1918, at which time it was discontinued. This stock is non-cumulative.

West Jersey & Seashore. Directors in March declared a semi-annual dividend of $2\frac{1}{2}$ per cent on the common stock, payable April 1, thereby changing the former annual rate of 4 per cent to 5 per cent. The company paid 5 per cent on its stock from 1910 to 1920, paid no dividends in 1921 and 1922 and 4 per cent in 1923 and 1924. The Pennsylvania owns a majority of the common shares.



Louisville & Nashville Three-Cylinder Pacific—Tractive Force, 47,000 lb.—Built by The American Locomotive Company

Locomotive Orders in 1925

Total one of lowest on record—Even recent buying not up to normal

By F. W. Kraeger

LOCOMOTIVES ordered for domestic service in the United States during 1925 totaled only 1,055. This compared with 1,413 in 1924; with 1,944 in 1923, and with 2,600 in 1922. In other words, it was the third successive year in which there has been a substantial decrease in locomotive orders from the year preceding. The 1925 total was furthermore the smallest for any year in the present century with the exception of the notably subnormal years of 1919 and 1921.

Orders reported as placed by the railways in Canada with Canadian builders totaled only 10, comparing with 71 in 1924; 82 in 1923 and 68 in 1922. Inasmuch as the Canadian locomotive purchases in 1925 were practically

in contradistinction to new business taken as shown in the totals of orders—was 994. This figure was inclusive of Canadian production. It compared with 1,810 in 1924,

TABLE II—ORDERS FOR LOCOMOTIVES SINCE 1901
Domestic Orders Only

Year	Loco- motives	Year	Loco- motives
1901.....	4,340	1908.....	1,182
1902.....	4,665	1909.....	3,350
1903.....	3,283	1910.....	3,787
1904.....	2,538	1911.....	2,850
1905.....	6,265	1912.....	4,515
1906.....	5,642	1913.....	3,467
1907.....	3,482	1914.....	1,265

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915.....	1,612	...	850	2,462
1916.....	2,910	...	2,983	5,893
1917.....	2,704	...	3,438	6,142
1918.....	2,593	209	2,086	4,888
1919.....	214	58	989	1,170
1920.....	1,998	189	718	2,905
1921.....	239	35	546	820
1922.....	2,600	68	131	2,799
1923.....	1,944	82	116	2,142
1924.....	1,413	71	142	1,626
1925.....	1,055	10	209	1,274

Prior to 1918, Canadian orders included under "Domestic."

TABLE I—LOCOMOTIVE ORDERS IN 1925

For service in the United States.....	1,055
For service in Canada.....	10
For export to other countries.....	209
Grand total.....	1,274

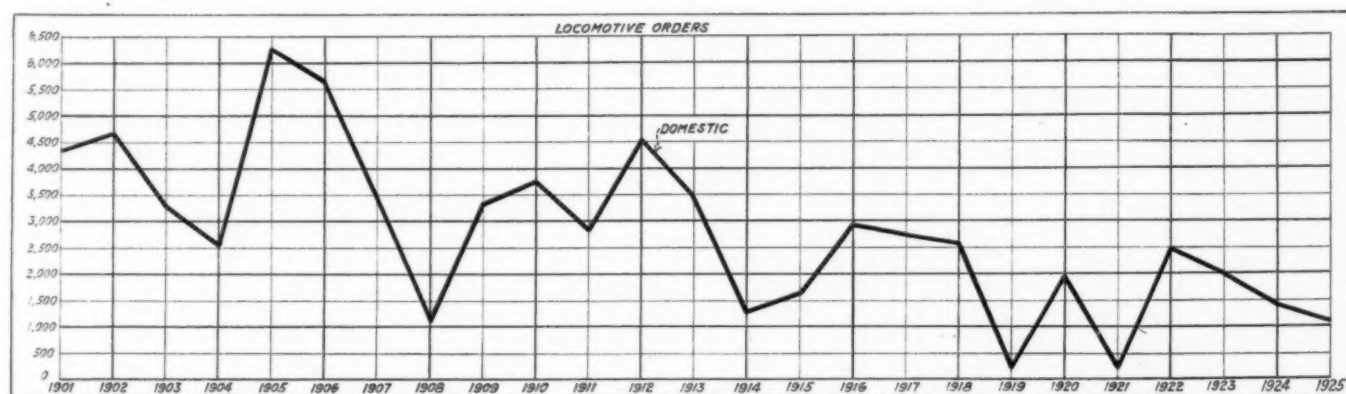
nil, it is natural that the total should be the smallest for a year ever reported in the *Railway Age* tabulations.

The export business was more satisfactory, orders for over 200 locomotives being reported, making the 1925 total the best for the past four years.

The number of locomotives built for domestic service—

with 3,505 in 1923, and was the smallest total reported since 1897.

It is necessary to emphasize the distinction between the



Locomotive Orders, 1901 to 1925

total of orders placed and the total of locomotives built. A locomotive takes several months to produce so that there is, of course, a considerable difference in time between the placing of the order for it and the date of delivery. Naturally, therefore, because of the overlap at the beginning and at the end of the year, the total of orders placed during a particular year cannot be expected to agree with the total of locomotives produced.

The Car Service Division of the American Railway Association reports monthly totals of locomotive installations and retirements. This also will not agree with the *Railway Age* totals of locomotives ordered or built. This follows because the Car Service Division total covers only Class I carriers whereas the *Railway Age* figures cover all carriers, and also because the Car Service Division report includes under installations locomotives leased from other roads or rebuilt locomotives.

There was no month in 1925 in which locomotive buying was particularly satisfactory. According to the

in the increased speed of trains over the road. However, it is significant that, as measured in net ton-miles, traffic in the first ten months of 1925 was only the slightest amount greater than in the same period of 1920, and less than in the first ten months of 1923. In the Northwest and on certain of the roads serving union coal mining areas, there was less traffic moved than in either 1920 or 1923. In the South—particularly as concerns the roads serving Florida—in the Southwest and in the Pocahontas region, there were, however, substantial increases in traffic and it will be observed that a surprisingly large percentage of all the year's buying was done by roads in these regions of expanding tonnage. However, the largest single order—100 locomotives—was placed by the New York Central.

The tabulations of locomotive orders this year contain two innovations; one in the form of a separate listing of electric locomotives, and the other a similarly separate listing of oil-electric or Diesel-electric locomotives. This is the first year that oil-electric or Diesel-electric locomotives have appeared in the lists, and although they are new they have been purchased by a considerable list of roads. It is of interest that the larger number of such locomotives have been purchased for the New York district where the Kaufman law has decreed the elimination of the steam locomotive.

The locomotive orders which are listed in the tables are compiled from official sources. Details are shown this year in a slightly different manner than last year. There are included the purchaser, type, service, weight, tractive force, cylinders, date of order, date of delivery and builder. The headings of tractive force, date of order and date of delivery are new and replace headings included last year showing whether or not certain locomotive specialties were specified for the equipment.

The following paragraph is quoted from the article in last year's annual review number:

"In the lists some few omissions of small unimportant orders doubtless occur. The details presented were supplied by the railways and other purchasers of locomotives in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. Because of the short time available for the compilation, and the haste necessary to insure publication so close after the end of the year, the *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tabulations or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy.

TABLE III—LOCOMOTIVES BUILT IN 1925†

Domestic (United States, Canada).....	994
Foreign	291
Total	1,285

Comparison with Previous Years							
Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896.....	866	309	1,176	1911*	3,143	387	3,530
1897.....	865	386	1,251	1912†	4,403	512	4,915
1898.....	1,321	554	1,875	1913†	4,561	771	5,332
1899.....	1,951	514	2,465	1914†	1,962	273	2,235
1900.....	2,648	505	3,153	1915†	1,250	835	2,085
1901.....	.....	.....	3,384	1916†	2,708	1,367	4,075
1902.....	.....	.....	4,070	1917†	2,585	2,861	5,446
1903.....	.....	.....	5,152	1918†	3,668	2,807	6,475
1904.....	.....	.....	3,441	1919†	2,162	1,110	3,272
1905.....	4,896	595	5,491	1920†	2,022	1,650	3,672
1906.....	6,232	720	6,952	1921†	1,185	638	1,823
1907.....	6,564	798	7,362	1922†	1,303	231	1,534
1908.....	1,886	456	2,342	1923†	3,505	280	3,785
1909.....	2,596	291	2,887	1924†	1,810	226	2,036
1910.....	4,441	314	4,755	1925†	994	291	1,285

*Includes Canadian output.

†Includes Canadian output and equipment built in railroad shops.

Railway Age records there were only four months in which orders exceeded even such a low total as 100, these months being March, October, November and December. The best month was December with a total of 216. There were no less than five months in which orders did not exceed even a total of 50. It is not easy to understand why the locomotive market was not more satisfactory during the year. It is true, of course, that even in October, in which month the railways moved the largest business in their history, the carriers reported about 4,500 of their locomotives stored in serviceable condition. It is believed in most quarters that the principal reason is the increased utilization of the motive power units as is evidenced in longer engine runs, in greater train loading and

Locomotive Orders in 1925

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Alabama, Tenn. & Northern.....	1	2-8-0	Frt.	164,000	35,400	20 x 24	August	October	Lima
Allison Lbr. Co.	1	2-6-2	Log	89,000	16,500	15 x 20	September	.....	Baldwin
Alton & Southern	1	2-8-2	Frt.	275,000	55,000	25 x 30	August	November	American
Anderson Middleton Lumber Co..	1	2-6-2	Log.	126,860	22,100	17 x 24	January	.....	Baldwin
Atchison, Topeka & Santa Fe....	15	2-10-2	.....	.....	.....	.....	December	.....	Baldwin
Atl. & West Pt., W. Ry. of Alt.	2	2-8-2	.....	.....	.....	26 x 30	January	.....	Lima
	2	2-8-2	Frt.	293,000	54,700	26 x 30	October	Jan., 1926	Lima
	2	4-6-2	Pass.	306,000	47,500	27 x 28	November	Jan., 1926	Lima
	1	4-6-0	Pass.	186,400	25,700	21 x 26	February	July	W. of Ala. Shops
Atlantic Coast Line.....	15	2-10-2	Frt.	391,980	75,770	30 x 32	March	November	Baldwin
	20	4-6-2	Frt.	280,010	43,115	25 x 28	March	August	Baldwin
	25	4-6-2	Frt.	280,010	43,115	25 x 28	May	December	Baldwin
	8	0-6-0	Sw.	160,000	37,750	22 x 26	November	November	Baldwin
	5	2-10-2	Frt.	391,980	75,770	30 x 32	November	Jan., 1926	Baldwin
	30	4-6-2	Frt.	280,010	43,115	25 x 28	November	Jan., 1926	Baldwin
	10	0-8-0	Sw.	215,300	51,041	25 x 28	November	Jan., 1926	Baldwin

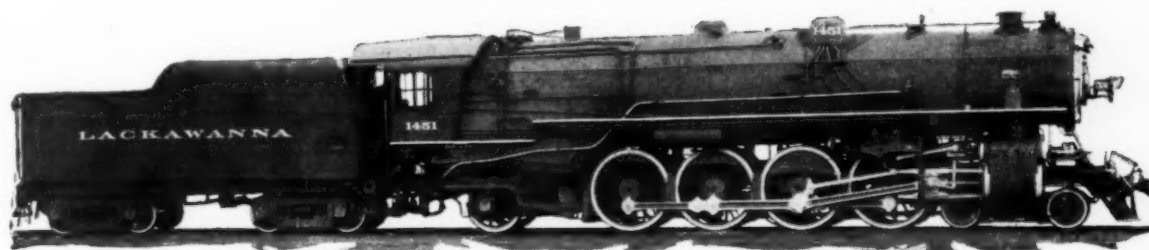
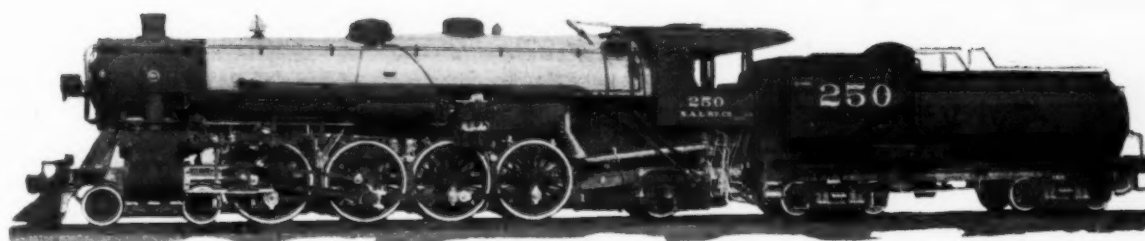
Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Attapulga Clay Company.....	1	0-4-0	Sw.	44,000	9,050	11 x 16	March	.....	Baldwin
Baltimore & Ohio	1	Mallet	Frt.	493,000	110,920	26 x 41 x 32	March	March	Company Shops
	1	4-8-2	Pass.	400,000	68,200	30 x 30	January	June	Company Shops
	1	4-8-2	Pass.	400,000	68,200	30 x 30	September	May	Company Shops
	25	2-10-2	.....	.....	.....	.....	December	.....	Lima
	25	2-10-2	.....	.....	.....	.....	December	.....	Baldwin
Bathurst Co., Ltd.	1	2-6-0	.....	132,000	.....	19 x 26	.....	.....	American
Beach Rogers & Co.	1	Geared	.....	48,000	.....	.....	.....	.....	Heisler
Bear Creek Log. Co.....	1	2-8-2	Log.	169,000	29,100	18 x 24	April	.....	Baldwin
Belt Ry. of Chicago.....	5	.....	Sw.	.....	.....	.....	January	.....	Baldwin
Bessemer Limestone Co.	2	Geared	.....	72,000	.....	.....	.....	.....	Heisler
Biles Coleman Lumber Co.....	1	Geared	.....	84,000	.....	.....	.....	.....	Heisler
Blodel, Stewart & Welch Corp., Ltd.	1	2-8-2	Frt.	169,000	28,600	18 x 24	August	.....	Baldwin
Boston & Albany	25	2-8-4	Frt.	389,000	69,400	28 x 30	October	Jan., 1926	Lima
Brooks-Scanlon Corp.	1	2-8-2	Log.	144,000	28,600	18 x 24	February	.....	Baldwin
Brooks-Scanlon Corp.	1	2-8-2	Log.	144,600	28,600	18 x 24	February	.....	Baldwin
Bruce, E. L., Co.....	1	2-6-2	.....	125,000	.....	17 x 24	.....	.....	American
Carnegie Steel Co.	2	0-4-0	Sw.	101,800	22,100	17 x 20	May	.....	Baldwin
Carter, W. T., & Bro.....	1	2-8-2	Frt.	142,230	27,000	18 x 24	February	.....	Baldwin
Central of Georgia	10	2-10-2	Frt.	382,000	73,829	30 x 32	July	December	Baldwin
	5	4-8-2	Pass.	316,500	47,800	27 x 28	October	Feb., 1926	Baldwin
	5	4-8-2	Pass.	316,500	47,800	27 x 28	March	June	American
Chesapeake & Ohio	50	2-8-2	Frt.	357,500	67,700	28 x 32	September	Jan., 1926	American
	20	2-8-8-2	Frt.	565,000	103,500	23 & 23 x 32	September	Jan., 1926	Baldwin
	5	4-6-2	Pass.	335,000	47,500	27 x 28	October	Jan., 1926	American
Chicago, Burlington & Quincy..	13	4-8-2	Pass.	367,700	52,750	27 x 30	March	September	Baldwin
Chicago Heights Term. Trans...	1	0-6-0	Sw.	163,500	40,000	22 x 26	November	.....	Baldwin
Chicago, Indianapolis & Louisville	1	4-8-0	Frt.	196,000	35,450	21 x 26	March	May	Company Shops
	1	4-8-0	Frt.	196,000	35,450	21 x 26	June	August	Company Shops
	1	4-8-0	Frt.	196,000	35,450	21 x 26	August	October	Company Shops
	1	4-8-0	Frt.	196,000	35,450	21 x 26	December	Feb., 1926	Company Shops
Chicago, Rock Island & Pac....	10	2-10-2	Frt.	391,000	.....	30 x 30	March	June-July	American
	10	0-8-0	Sw.	230,000	.....	23 1/2 x 30	February	May-June	American
Chicago Short Line	1	0-6-0	Sw.	144,700	34,400	21 x 26	February	April	Baldwin
Chicago West. Pull. & Southern	1	0-6-0	Sw.	166,140	39,800	22 x 26	January	.....	Baldwin
Clark & Wilson Lbr. Co.....	1	2-8-2	Log.	169,000	29,100	18 x 24	October	.....	Baldwin
Clemons Logging Co.	1	2-6-6-2	Log.	245,500	42,500	18 & 28 x 24	February	.....	Baldwin
Columbia Steel Corp.....	1	0-6-0	Sw.	140,000	35,000	21 x 26	April	.....	Baldwin
Commonwealth Steel Co.....	1	0-6-0	.....	.....	.....	.....	January	.....	Baldwin
	1	0-6-0	.....	.....	.....	.....	August	.....	Baldwin
Cornwall	1	2-8-0	Frt.	216,360	49,400	23 x 28	February	.....	Baldwin
Current River Lumber Co.....	1	2-8-2	Log.	153,800	28,800	19 x 24	April	.....	Baldwin
Davison Chemical Co.....	1	0-6-0	.....	123,000	.....	19 x 26	.....	.....	American
Delaware, Lackawanna & Western	3	4-8-2	Pass.	382,000	61,100	25 x 28 (3 cyl.)	June	September	American
Dents Run Lumber Co.....	1	Geared	.....	130,000	.....	.....	.....	.....	Heisler
Denver & Rio Grande Western..	10	2-8-2	Frt. 36" Ga.	171,420	36,200	20 x 24	February	August	Baldwin
	8	4-8-2	Pass.	.....	.....	29 x 30	November	.....	Baldwin
	2	4-8-2	Pass.	.....	.....	26 x 28 (3 cyl.)	November	.....	Baldwin
Detroit & Toledo Shore Line....	1	2-8-2	Frt.	310,400	54,800	26 x 30	April	August	American
	2	0-8-0	Sw.	208,510	45,200	22 x 28	April	September	American
Detroit Terminal	2	0-8-0	Sw.	239,000	55,200	25 x 30	July	.....	Baldwin
	3	0-8-0	Sw.	239,000	55,200	25 x 30	November	.....	Baldwin
	2	0-8-0	Sw.	329,000	.....	25 x 30	March	.....	American
Dickey, W. S., Clay & Mfg. Co.	1	0-4-0	Sw.	49,000	9,300	11 x 16	May	.....	Baldwin
Donora Southern	1	0-6-0	Sw.	161,600	41,100	22 x 26	February	June	Baldwin
East Jersey RR & Term. Co....	1	0-6-0	Sw.	127,700	27,200	19 x 24	January	March	Baldwin
Fairport, Painesville & East....	1	0-6-0	Sw.	161,000	38,500	22 x 26	April	.....	Baldwin
	1	0-6-0	Sw.	.....	.....	.....	March	.....	American
Fisher Hard Lumber Co.....	1	Geared	Log.	67,805	.....	.....	.....	.....	Heisler
Florida East Coast	6	0-8-0	Sw.	216,000	51,000	25 x 28	July	August	American
	15	2-8-2	Frt.	297,000	54,700	26 x 30	July	August	American
	12	4-8-2	Pass.	318,000	44,000	26 x 28	August	October	American
Gary Tube Co.	1	0-6-0	Sw.	164,500	41,000	22 x 28	February	.....	Baldwin
Georgia	2	2-8-2	Frt.	293,000	54,700	26 x 30	October	Jan., 1926	Lima
Great Northern	9	2-8-2	Frt.	283,420	50,600	25 x 30	.....	.....	Company Shops
	7	2-8-2	Frt.	320,100	6,600	28 x 32	.....	.....	Company Shops
Gulf Coast Lines	10	2-8-2	Frt.	333,000	59,800	27 x 32	December	.....	American
Gulf, Mobile & Northern.....	5	2-10-0	Frt.	254,000	60,200	25 x 30	January	June	Baldwin
Harbeson, W. D., Lumber Co..	1	2-6-2	Log.	107,800	21,700	16 x 24	July	.....	Baldwin
Harleigh Brookwood Coal Co...	1	Geared	.....	72,000	.....	.....	.....	.....	Heisler
Hawley McIsaac Coal Co.....	1	Geared	.....	64,000	.....	.....	.....	.....	Heisler
Hobi Timber Co.	1	2-8-2	Log.	155,200	31,900	19 x 24	July	.....	Baldwin
Hocking Valley	10	0-8-0	Sw.	221,000	51,200	25 x 28	October	Jan., 1926	Lima
Indiana State Farm	1	Geared	.....	64,000	.....	.....	.....	.....	Heisler
Indianapolis Union	1	0-8-0	Sw.	217,620	51,200	25 x 28	April	.....	Baldwin
International-Great Northern ...	5	4-6-2	Pass.	290,000	44,000	27 x 28	December	.....	American
International Harvester Co.	1	0-4-0	Sw.	111,500	23,400	17 x 20	January	.....	Baldwin
	1	0-4-0	Sw.	102,000	21,200	17 x 24	March	.....	Baldwin

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Kansas City, Mex. & Orient....	5	2-10-0	Fr.	252,100	60,000	25 x 30	June	September	Baldwin
Kansas City Stock Yards.....	1	0-6-0	Sw.	135,000	33,600	20 x 26	February	.....	Baldwin
Kitchen Lumber Co.	1	Geared	....	84,000	.....	.....	.....	.....	Heisler
Lake Terminal	2	0-8-0	....	218,000	.....	25 x 28	July	.....	American
Lehigh & Hudson River	4	2-8-0	Fr.	309,700	71,500	27 x 32	March	July	Baldwin
Litchfield & Madison	1	0-8-0	....	205,000	.....	22 x 28	April	.....	American
Long Bell Lumber Co.	2	2-8-2	....	165,000	.....	18 x 24	.....	.....	American
Louisville & Nashville.....	1	4-6-2	Pass.	295,000	47,000	22½ x 28 (3 cyl.)	Dec., 1924†	April	American
	24	2-8-2	Fr.	320,000	60,000	27 x 32	October	Feb., 1926	American
	8	4-8-2	Pass.	327,000	53,900	27 x 30 (3 cyl.)	October	Feb., 1926	Baldwin
McCloud River	2	2-6-2	....	120,000	.....	17 x 24	March	.....	American
	2	2-6-2	....	143,000	.....	19 x 24	June	.....	American
Maryland & Pennsylvania	1	2-8-0	Fr.	207,050	43,000	22 x 28	May	.....	Baldwin
Mich. Limestone & Chem. Co....	2	0-6-0	Sw.	100,000	.....	.....	January	.....	Lima
Midland Valley	2	2-8-2	Fr.	292,000	54,800	26 x 30	January	.....	Baldwin
Lancaster & Chester Ry.....	1	2-8-0	Fr.	156,000	32,700	20 x 26	October	.....	Baldwin
Missouri-Illinois	2	2-8-0	Fr.	220,000	47,600	23 x 28	June	September	American
Missouri Pacific	10	2-10-2	Fr.	420,000	80,000	30 x 32	November	.....	Baldwin
	15	0-8-0	Sw.	224,490	53,958	25 x 28	December	.....	Lima
Mt. Emily Lumber Co.....	2	2-8-2	....	173,000	.....	18 x 24	.....	.....	American
Nash., Chatt. & St. Louis.....	5	4-8-2	Pass.	326,950	53,800	27 x 30	January	June	Baldwin
Nevada Copper Belt	1	2-8-0	....	141,000	.....	19 x 26	March	.....	American
Newburgh & South Shore.....	1	0-6-0	Sw.	178,000	42,090	22 x 28	April	June	Baldwin
	1	0-10-0	Sw.	293,000	68,850	27 x 30	April	July	Baldwin
New York Central	100	4-8-2	Fr.	368,700	72,700	27 x 30	October	Jan., 1926	American
	5	0-8-0	....	.....	.....	.....	March	.....	Lima
	*20	Tenders	....	.....	.....	.....	May	.....	American
	*6	Tenders	....	.....	.....	.....	May	.....	American
N. Y., Chicago & St. Louis.....	10	0-8-0	Sw.	221,000	51,000	25 x 28	April	June	Lima
	10	0-8-0	Sw.	.....	.....	.....	May	.....	Lima
N. Y., N. H. & Hartford.....	3	4-8-2	Fr.	376,000	67,300	22x28&30 (3 cyl.)	October	Jan., 1926	American
	7	4-8-2	Fr.	360,000	67,300	27 x 30	October	Jan., 1926	American
	*5	Htg. Tenders	....	72,900	.....	.....	October	Dec., 1926	Baldwin
Norfolk & Western	10	4-8-2	Fr.	382,000	66,530	28 x 30	November	April, 1926	Roanoke Shops
North Carolina Lumber Co.....	1	2-6-2	Log.	50,000	8,220	11 x 16	January	.....	Baldwin
Osage Railway	1	2-10-0	Fr.	217,200	46,500	24 x 28	March	.....	Baldwin
Pike County Collieries Co.....	1	Geared	....	72,000	.....	.....	.....	.....	Heisler
Potlatch Lumber Co.....	1	2-6-6-2	....	.....	.....	.....	December	.....	Baldwin
Raritan River Sand Company...	1	0-4-0	Sw.	27,000	5,500	9 x 14	March	.....	Baldwin
Reading	5	0-8-0	Sw.	280,610	67,900	26 x 32	March	July	Baldwin
Richmond Car Works, Inc.....	1	0-6-0	Sw.	105,000	21,400	16 x 24	September	November	American
Richmond, Fred & Potomac....	2	4-6-2	Pass.	293,300	42,800	26 x 28	July	November	Baldwin
	2	4-8-2	Fr.	381,000	57,510	28 x 30	July	November	American
	2	0-6-0	Sw.	169,000	41,200	21 x 28	July	October	American
Rutland	3	4-6-2	Pass.	278,000	43,100	25 x 28	February	June	American
Saginaw Timber Co.....	1	2-6-6-2	Log.	220,000	37,500	17 & 26 x 24	January	.....	Baldwin
St. Louis-San Francisco	5	4-8-2	Pass.	342,200	54,100	28 x 28	February	September	Baldwin
	15	2-8-2	Fr.	328,800	59,800	27 x 32	February	September	Baldwin
	10	4-8-2	Pass.	346,000	54,100	28 x 28	November	.....	Baldwin
	15	2-8-2	Fr.	344,600	59,800	27 x 32	November	.....	Baldwin
St. Paul Bridge & Terminal....	1	0-8-0	Sw.	210,000	49,500	24 x 29	July	September	Baldwin
Santa Maria Valley	1	2-8-2	Fr.	166,000	31,900	19 x 26	March	.....	Baldwin
Savannah & Atlanta	1	2-8-2	Fr.	209,000	40,400	22 x 28	July	.....	Baldwin
Seaboard Air Line	10	2-8-2	Fr.	302,000	66,200	26 x 30	April	.....	Baldwin
	10	4-8-2	Pass.	320,900	48,200	27 x 28	April	.....	Baldwin
	6	4-8-2	Pass.	320,500	48,200	27 x 28	August	.....	Baldwin
	4	2-8-2	Fr.	302,000	66,200	26 x 30	August	.....	Baldwin
	40	2-8-2	Fr.	302,000	66,200	26 x 30	December	.....	Baldwin
	5	4-8-2	Pass.	320,500	48,200	27 x 28	December	.....	Baldwin
	20	2-8-2	....	300,000	.....	26 x 30	April	.....	American
Shamokin Coal Co.....	1	0-4-0	Sw.	37,000	7,740	10 x 16	May	.....	Baldwin
Sierra of Calif.	1	2-8-2	Fr.	174,000	33,000	19 x 26	August	.....	Baldwin
Stoss-Sheffield S. & I. Co.....	2	2-8-0	Fr.	189,890	40,400	22 x 28	February	.....	Baldwin
Southern Pacific, La. & Tex. Lines	4	4-4-2	Pass.	211,850	26,080	20 x 28	.....	May	Company Shops
	1	4-4-2	Pass.	220,280	37,080	20 x 28	.....	May	Company Shops
	2	0-6-0	Sw.	155,000	31,020	20 x 26	May	December	Company Shops
Standard Oil Co. of N. J.....	2	0-4-0	Sw.	28,250	5,930	9 x 14	May	.....	Baldwin
Steelton & Highspire.....	2	0-6-0	....	144,000	.....	21 x 26	.....	.....	American
Tatum Lumber Co.	1	2-8-2	Log.	156,000	30,700	19 x 26	January	.....	Baldwin
	1	4-4-0	Pass.	103,020	16,600	17 x 24	February	.....	Baldwin
Tennessee Central	4	4-8-2	Pass. & Fr.	275,000	46,000	24 x 28	October	Jan., 1926	American
Tennessee Copper Co.	1	0-6-0	Sw.	132,000	31,860	20 x 26	September	.....	Baldwin
Terminal R.R. Assn., of St. Louis	2	0-8-0	Sw.	252,500	60,300	26 x 28	October	.....	Company Shops
Texas & Pacific	5	4-8-2	Pass.	370,000	63,500	27 x 30	July	December	American
	10	2-10-4	Fr.	440,000	95,000	29 x 32	July	Nov.-Dec.	Lima
	10	0-8-0	Sw.	220,000	54,500	22 x 28	July	December	Baldwin
Texas City Terminal	1	0-6-0	Sw.	131,500	31,860	20 x 25	January	March	Baldwin
Texas Co.	1	0-6-0	Sw.	144,300	35,000	21 x 26	June	August	Baldwin

† Not reported in 1924 tabulation.

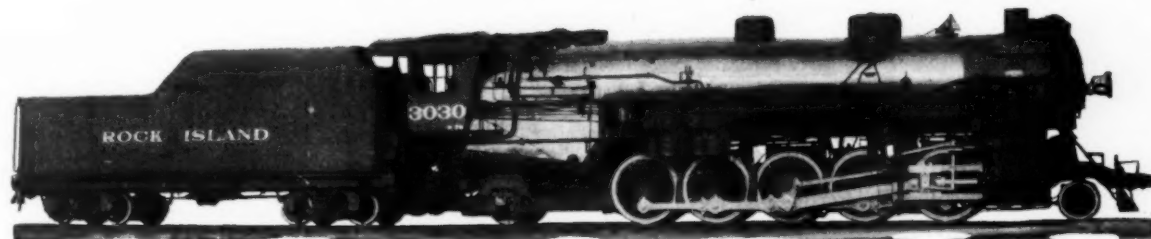
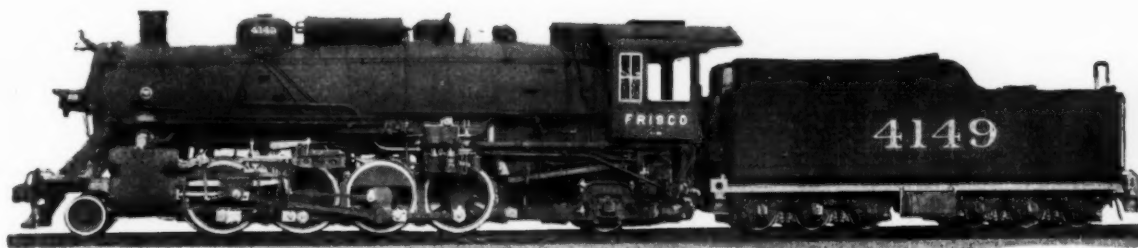
* Not included in totals.

Seaboard Air Line
Mountain Type.
Tractive Force,
48,200 lb.
Built by Baldwin.



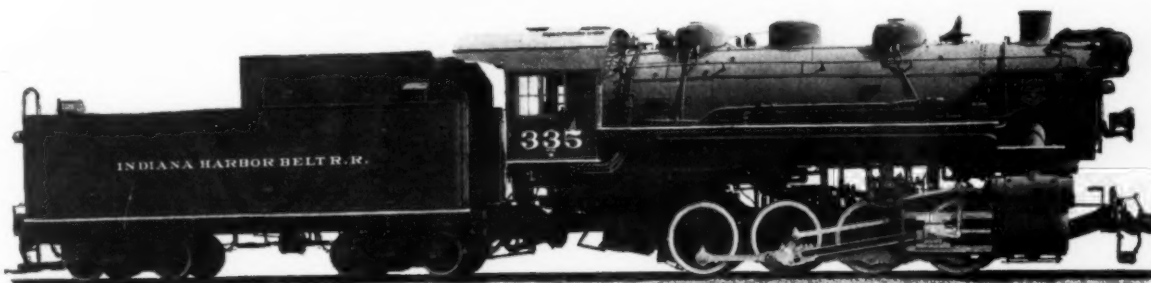
Lackawanna
Three-Cylinder
Mountain Type.
Tractive Force,
61,100 lb.
Built by American.

St. Louis-
San Francisco
Mikado.
Tractive Force,
59,800 lb.
Built by Baldwin.



Rock Island
2-10-2 Type.
Tractive Force,
77,800 lb.
Built by American.

Belt Railway of
Chicago Eight-
wheel Switcher.
Tractive Force,
66,300 lb.
Built by Baldwin.



Indiana Harbor
Belt Eight-
wheel Switcher.
Tractive Force,
51,200 lb.
Built by Lima.

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Thunder Lake Lumber Co.....	1	2-8-0	Log.	80,550	19,100	15 x 20	May	.....	Baldwin
Toledo Terminal	2	2-8-0	Frt.	202,000	41,800	22 x 28	April	July	American
Uintah Railway	1	2-6-6-2	Frt.	.....	.....	15 & 15 x 22	November	.....	Baldwin
Union Elec. Light & Power Co...	1	0-4-0	Sw.	78,000	17,360	14 x 22	January	March	Baldwin
United Electric Coal Co.....	1	0-4-0	Frt.	41,000	.....	11 x 16	August	September	Vulcan Iron Wks.
Union Pacific	1	4-12-2	Frt.	495,000	96,500	27 x 31 & 32 (3)	September	March, 1926	American
United Gas. Imp. Cont. Co.....	1	0-4-0	Sw.	47,000	9,870	11 x 16	July	.....	Baldwin
Unity Railways Co.	1	2-8-0	Frt.	216,360	45,600	23 x 28	February	.....	Baldwin
Varn Turp. & Cattle Co., Inc...	1	2-6-2	Frt.	64,000	11,020	12 x 18	September	.....	Baldwin
Wabash	25	0-8-0	Sw.	217,500	52,921	25 x 28	December	Feb., 1926	Lima
Washington & Lincolnton	1	2-8-0	Frt.	132,250	28,400	19 x 24	May	.....	Baldwin
Weed Lbr. Co.	1	2-8-2	.....	160,000	.....	19 x 24	.....	.....	American
Weston, H., Lumber Co.....	1	2-6-0	Log.	112,000	24,800	18 x 24	June	.....	Baldwin
Wichita Falls & Southern.....	2	2-8-0	Frt.	155,750	31,600	20 x 26	February	.....	Baldwin
Willard State Hospital	1	0-6-0	Sw.	106,940	24,400	18 x 24	January	.....	Baldwin
Winnboro Granite Corp.	1	2-6-2	Frt.	101,000	20,430	16 x 24	September	.....	Baldwin
Winston-Salem So. Bound.....	2	2-8-2	Frt.	295,000	59,000	27 x 30	March	May	Baldwin
Wisconsin Lime & Cement Co...	1	0-6-0	.....	130,000	.....	18 x 24	.....	.....	American
Wisconsin Steel Works	1	.....	Sw.	95,000	21,200	17 x 24	March	May	Baldwin
.....	1	.....	Sw.	111,500	23,400	17 x 20	January	March	Baldwin
Yosemite Valley	1	2-6-0	Pass. & Frt.	144,000	28,600	19 x 28	September	December	Baldwin

Canada

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Canadian National	5	4-8-2	Pass.	354,110	49,600	26 x 30	January	.....	Baldwin
Dominion Coal Co.	1	2-8-2	.....	227,000	.....	21 x 28	.....	.....	American
.....	1	2-6-4	.....	225,000	.....	19 x 26	.....	.....	American
Temiskaming & Nor. Ontario...	3	2-8-2	Frt.	272,700	45,500	25 x 30	February	June	Canadian

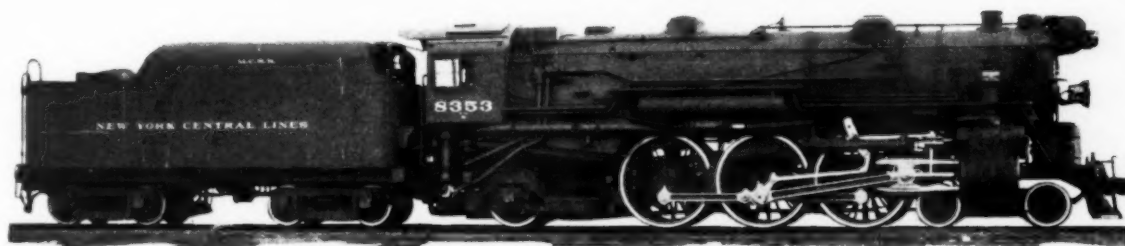
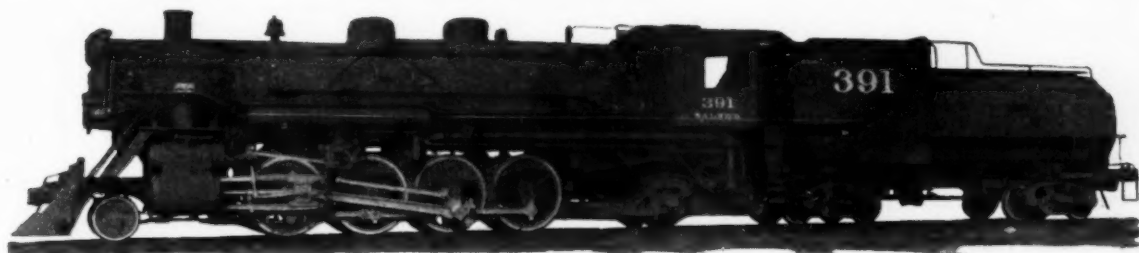
Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
American Ry. of Porto Rico....	1	2-8-0	.....	.....	.....	.....	October	.....	Baldwin
Andes Copper Mining Co.	3	2-8-2	.....	.....	.....	.....	January	.....	Baldwin
.....	1	2-8-0	.....	.....	.....	.....	December	.....	Baldwin
Ararangua, Cia Santa Cath. Car. De Brazil	3	4-6-2	.....	.....	.....	.....	January	.....	Baldwin
Atkins, E., & Co. (Cuba).....	3	2-8-0	Frt.	126,000	23,800	18 x 24	June	September	American
.....	1	2-8-0	Frt.	137,500	29,900	19 x 26	July	October	American
.....	2	2-8-0	Frt.	126,000	23,800	18 x 24	September	November	American
.....	1	2-6-2	Frt.	119,000	23,800	18 x 24	September	October	American
Ceiba Gran F.c de la Venezuela.	1	2-8-0	.....	.....	.....	.....	December	.....	Baldwin
Central Céspedes (Cuba)	1	2-8-0	.....	.....	.....	.....	November	.....	Baldwin
Central Cuba Sugar Co. (Cuba)	3	2-6-0	.....	.....	.....	.....	October	.....	Baldwin
Central Macareno (Cuba).....	1	2-8-0	.....	.....	.....	.....	July	.....	Baldwin
Central San Antonio (Cuba)....	1	2-8-0	.....	.....	.....	.....	October	.....	Baldwin
Cerro de Pasco (Peru).....	2	2-8-0	.....	168,000	.....	21 x 28	October	.....	American
Chile Exploration Co.	12	2-8-2	.....	.....	.....	.....	April	.....	Baldwin
Chilean State Rys.	12	2-8-2	Frt.	196,000	37,000	22 x 28	October	Jan., 1926	American
Consolidated R.R.'s. of Cuba....	6	4-8-2	.....	.....	.....	.....	November	.....	Baldwin
Cuba Railroad	6	2-8-2	.....	225,000	.....	22 x 28	.....	.....	American
Curitiba, Cia., de Madeira (Brazil)	1	2-8-2	.....	.....	.....	.....	May	.....	Baldwin
Government of Porto Rico.....	3	.....	Sw.	.....	.....	.....	December	.....	Baldwin
Guantanamo & Western (Cuba).	2	2-8-0	.....	150,000	.....	20 x 24	.....	.....	American
Guayaquil & Quito (Peru).....	2	2-8-0	.....	.....	.....	.....	November	.....	Baldwin
Hawaii Sugar Co.	1	2-6-2	.....	.....	.....	.....	July	.....	Baldwin
Havana Central	6	4-4-0	Pass.	156,750	17,000	18½ x 24	May	September	Baldwin
Imperial Gov't. Rys. (Japan)...	6	4-6-2	.....	192,000	.....	17.72 x 26 (3)	.....	.....	American
Int. Rys. of Cent. Amer. (Guatemala)	9	2-8-0	Frt.	.....	.....	16½ x 20	January	.....	Baldwin
..... (Salvador)	3	2-8-0	Frt.	.....	.....	16½ x 20	January	.....	Baldwin
New Niquero Sugar Co. (Cuba)	1	2-8-0	.....	.....	.....	.....	October	.....	Baldwin
Nitrate Rys. of Chile.....	6	2-8-2	.....	.....	.....	.....	July	.....	Baldwin
Oahu Railway & Land Co.....	2	2-8-2	.....	.....	.....	.....	January	.....	American
.....	2	2-8-2	.....	.....	.....	.....	December	.....	American
Oeste de Minas, E. de F., (Brazil)	1	4-6-2	.....	.....	.....	.....	January	.....	Baldwin
.....	7	4-6-2	.....	.....	.....	.....	October	.....	Baldwin
Paracatu E. de F. (Brazil).....	2	2-8-2	.....	.....	.....	.....	June	.....	Baldwin
Paulista de Estrada de Ferro (Brazil)	4	4-6-2	.....	.....	.....	.....	October	.....	Baldwin
Perpiao Mines (China).....	1	.....	.....	.....	.....	.....	May	.....	Baldwin
Punta Alegre Sugar Co.....	1	2-8-0	.....	138,000	.....	19 x 26	July	.....	American



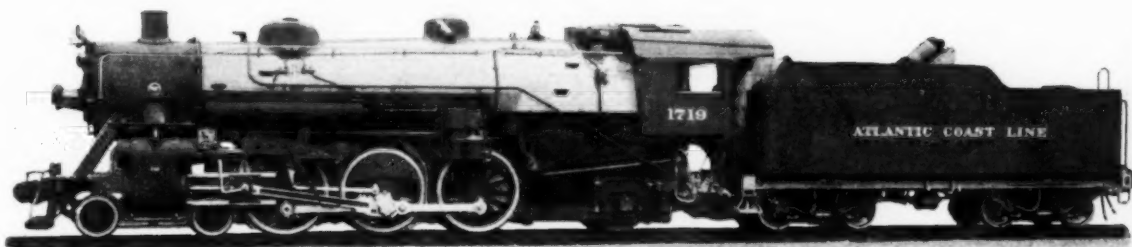
Wabash
Three-cylinder
Mikado.
Tractive Force,
64,600 lb.
Built by American.

Seaboard Air
Line Mikado.
Tractive Force
with Booster,
66,200 lb.
Built by American.



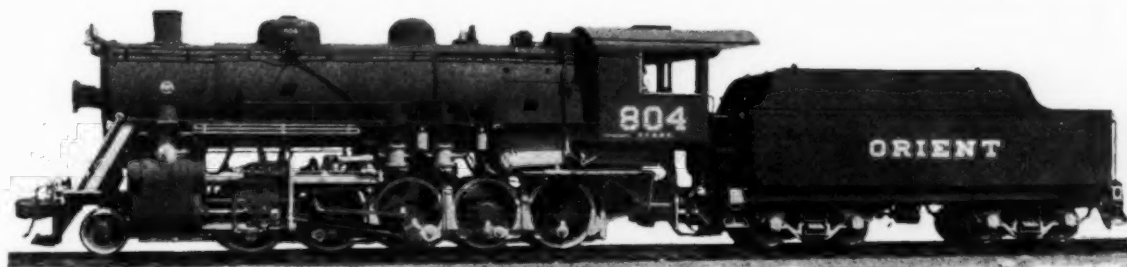
Michigan Central
Pacific.
Tractive Force
with Booster,
47,300 lb.
Built by American.

Atlantic Coast
Line Pacific.
Tractive Force,
43,100 lb.
Built by Baldwin.



Rock Island
Eight-wheel
Switcher.
Tractive Force,
52,900 lb.
Built by American.

Kansas City,
Mexico & Orient
Decapod.
Tractive Force,
80,000 lb.
Built by Baldwin.



Some of the Interesting Locomotive Orders of 1925

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of Order	Date of Delivery	Builder
Salvador Ry.	1	2-8-0	....	.....	.....	.....	March	.....	Baldwin
Sao Paulo Rio Grande, E. de F. (Brazil)	24	2-8-2	....	.....	.....	.....	June	.....	Baldwin
Sequeira & Cia., Ltd. (Brazil) ..	4	2-8-2	....	.....	.....	.....	May	.....	Baldwin
Siamese State Rys.	4	2-8-2	....	.....	.....	3 cyl.	July	.....	Baldwin
	4	4-6-2	....	.....	.....	3 cyl.	July	.....	Baldwin
Sorocabana Ry. (Brazil)	11	4-6-2	....	.....	.....	.....	September	.....	Baldwin
South African Rys. & Harbours	5	4-6-2	....	.....	.....	.....	August	.....	Baldwin
	10	4-8-2	....	.....	.....	.....	August	.....	Baldwin
Tolima, F. C. Del (Colombia) ..	4	2-8-0	....	.....	.....	.....	November	.....	Baldwin
Ulen & Company (Colombia)	6	2-8-2	....	.....	.....	.....	October	.....	Baldwin
Victoria-a-Minas	4	4-6-0	....	.....	.....	.....	December	.....	Baldwin

Electric Locomotives

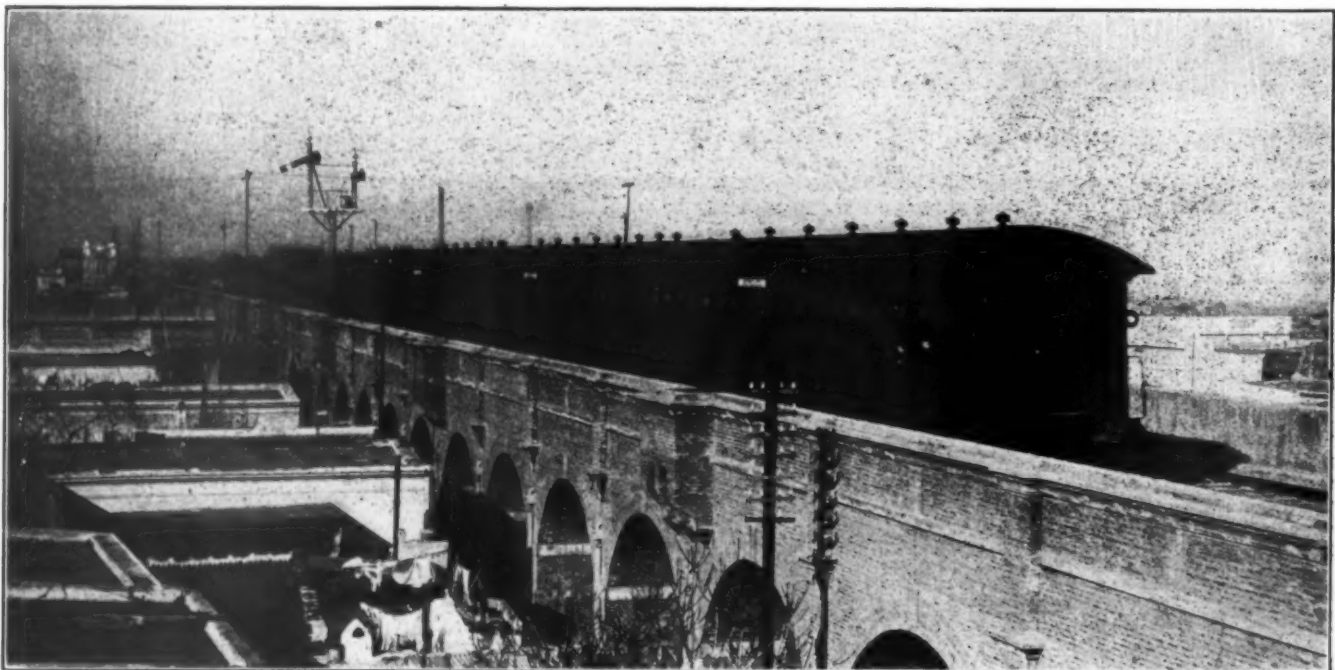
Puchaser	No.	Wheel Arrangement	Service	Weight	Tractive Force	Voltage	Date of Order	Date of Delivery	Builder
Chic., So. Shore & So. Bend.	4	0-4-0-0-4-0	Frt. & Sw.	160,000	.....	1,500 d.c.	September	May, 1926	West'h'se Elec.
Delaware, Lackawanna & West'n.	1	.....	Sw.	100,000	25,000	d.c.	November	.....	General Electric
Great Northern	4	2-8-2	Pass. & Frt.	355,000	.....	11,500 a.c.-d.c.	June	June, 1926	West'h'se Elec.
Michigan Central	2	0-4-4-0	Sw.	240,000	.....	600 d.c.	June	Feb.-Apr., '26	General Electric
N. Y., N. H. & Hartford	3	0-4-0-0-4-0	Sw.	160,000	23,200	11,000 a.c.	November	July, 1926	West'h'se Elec.
N. Y. Rapid Transit Co.	1	.....	Sw.	100,000	.....	600 d.c.	.....	.....	General Electric
New York Central	10	0-4-4-4-4-0	Pass.	268,000	18,840	600 d.c.	Nov., 1925	July, 1926	American
Portland Electric Power Co.	1	.....	Frt.	95,000	.....	.....	.....	.....	Company Shops
St. Louis & Belleville Elec. Ry.	1	.....	Frt.	160,000	.....	.....	.....	.....	General Elec.
San Diego Elec. Ry.	1	0-4-0-0-4-0	Frt.	100,000	.....	600 d.c.	December	Feb., 1926	West'h'se Elec.

Export

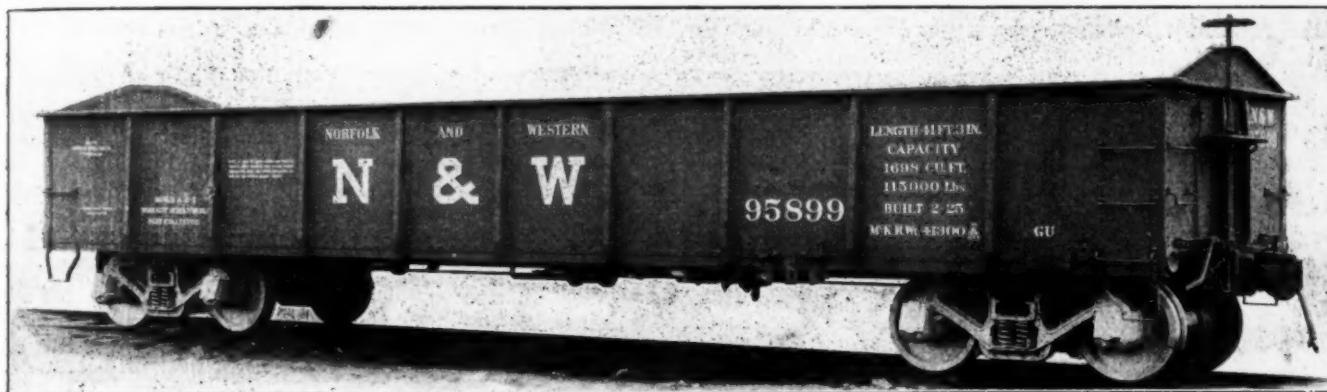
Hershey Cuban	3	.....	Sw.	120,000	.....	.....	.....	.....	General Electric
Paulista Ry. (Brazil)	1	2-4-0-0-4-2	Pass.	284,000	21,000	3,000 d.c.	January	Jan., 1926	West'h'se Elec.
	4	0-6-0-0-6-0	Frt.	235,000	32,400	3,000 d.c.	December	Aug., 1926	West'h'se Elec.
	4	.....	Sw.	122,000	.....	3,000 d.c.	.....	.....	General Electric

Oil-Electric or Diesel Electric Locomotives

Purchaser	No.	Wheel Arrangement	Service	Weight	Tractive Force	Cylinders No. Dia. and Stroke	Builders
Baltimore & Ohio	1	0-4-4-0	Sw.	120,000	50,000	6-10 x 12	Ingersoll Rand-Amer.-Gen. Elec.
Central of New Jersey	1	0-4-4-0	Sw.	120,000	30,000	6-10 x 12	Ingersoll Rand-Amer.-Gen. Elec.
Chicago & North Western	1	.....	Sw.	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Delaware, Lacka. & Western	2	.....	Sw.	120,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Erie	1	0-4-4-0	Sw.	120,000	300 h. p.	6-10 x 12	Ingersoll Rand-Amer.-Gen. Elec.
Lehigh Valley	1	0-4-4-0	Sw.	120,000	36,000	6-10 x 12	Ingersoll Rand-Amer.-Gen. Elec.
Long Island	1	.....	Frt. & Sw.	200,000	600 h. p.	.....	Ingersoll Rand-Amer.-Gen. Elec.
	1	Gas-Electric	.....	120,000	500 h. p.	.....	West'h'se-Brill
New York Central	1	4-8-4	Pass.	296,000	.....	.....	McIntosh & Seymour-Amer.-Gen. Elec.
	1	4-8-4	Frt.	257,000	.....	.....	Ingersoll Rand-Amer.-Gen. Elec.
Pennsylvania	3	0-4-0	Sw.	130,000	42,500	.....	Bessemer-P. R. R. Shops



Buenos Aires Southern Viaduct, Entrance to Buenos Aires



Norfolk & Western All-Steel Gondola, 115,000 lb. Capacity Built by the Pressed Steel Car Company

Freight Car Orders in 1925

*Third less than in 1924 and about same as in 1923—
Forecasts not borne out*

By F. W. Kraeger

THE freight cars ordered during 1925 for service in the United States totaled, according to the *Railway Age's* compilations, 92,816 cars. This compared with 143,728 ordered in 1924, with 94,471 in 1923, and with 180,154 in 1922. The 1925 total was considerably below normal. During much of the year the freight car market was stagnant. It later revived to

113,761 cars in 1924. The total of cars built should not be compared with the installations of cars reported in the statistics issued monthly by the Car Service Division

TABLE I—FREIGHT CAR ORDERS IN 1925

For service in the United States.....	92,816
For service in Canada.....	642
For export to other countries.....	2,138
Grand total.....	95,596

the extent that about one-half the year's orders were placed after October 1.

The orders placed by Canadian purchasers with Canadian builders totaled only 642, this light business being similar to that of 1921 or 1922.

Domestic freight car production—as distinguished from orders placed—totaled 105,935 cars, as compared with

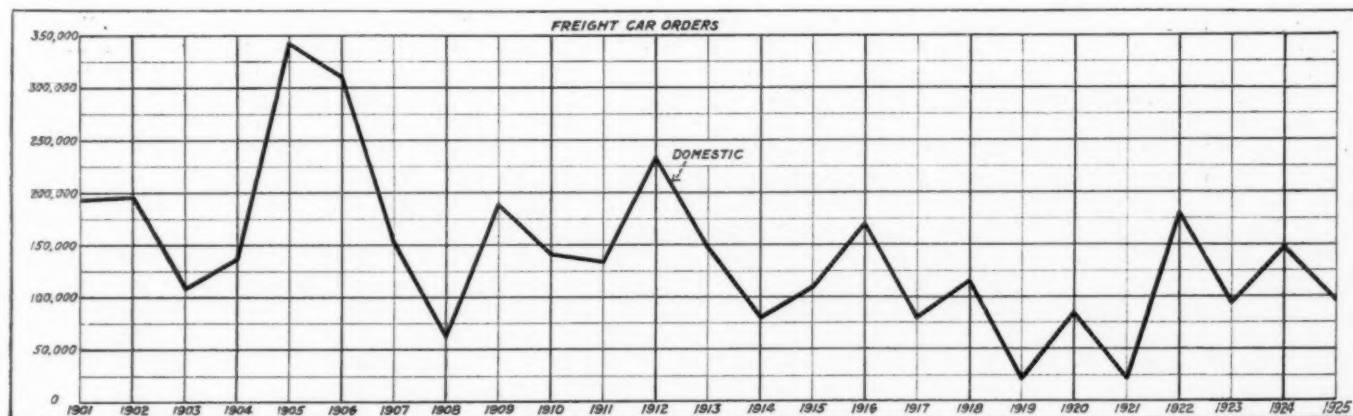
TABLE II—ORDERS FOR FREIGHT CAR. SINCE 1901
Domestic Orders

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	109,792		18,222	128,014
1916	170,054		35,314	205,368
1917	79,367		53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	105,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596

Prior to 1918, Canadian orders included in domestic.



Freight Car Orders, 1901 to 1925

of the American Railway Association. The Car Service Division totals include only installations of the Class I roads. The *Railway Age* figures include the production of all cars, whether for Class I, or Class II and III roads, as well as private car line cars. Furthermore, the *Railway Age* totals include only new cars whereas the Car Service Division totals include leased and rebuilt cars.

The year 1925 was an extremely disappointing one to the car building industry. The forecasts of a good year in freight car buying were not borne out. When

TABLE III—FREIGHT CARS BUILT IN 1925

	United States	Canada	Total
Domestic	105,935	.....	.....
Foreign	3,010	.....	.....
Total	108,945	.....	.....

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886
1900	113,070	2,561	115,631
1901	132,591	4,359	136,950
1902	161,747	2,800	162,599
1903	153,195	1,613	152,801
1904	60,955	1,995	60,806
1905*	162,701	5,305	165,155
1906*	236,451	7,219	240,503
1907*	280,216	9,429	284,188
1908*	75,344	1,211	76,555
1909*	91,077	2,493	93,570
1910*	176,374	4,571	180,945
1911*	68,961	3,200	72,161
1912†	148,357	4,072	152,429

* Includes Canadian output.

† Includes Canadian output and equipment built in company shops.

	United States			Canadian			Grand Total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1913	176,049	9,618	185,667	22,017	.....	22,017	207,684
1914	97,626	462	98,088	6,453	.....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	.....	.....	5,580	135,001
1917	115,705	23,939	139,643	3,658	8,100	11,758	151,401
1918	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,793	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	.....	.....	.....	.....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	.....	.....	.....	.....
1924	113,761	1,141	114,902	1,721	.....	1,721	116,623
1925	105,935	3,010	108,945	.....	.....	.....	.....

Table IV is tabulation of orders.

the year began there was a heavy buying movement under way but this auspicious circumstance was promptly dissipated and succeeded instead by dullness of an unusual degree. Orders for the first nine months of the year totaled only about 45,000 cars or an average of but 5,000 cars a month. In June and July orders were reported for about 800 cars each. No really adequate explanation has been offered of the so-nearly complete absence of freight car buying during the first three-quarters of the year. One reason that has fairly ready acceptance has been the increased efficiency of railway operation and the increased utilization of equipment. It is believed in many quarters that 1925 was a year of catching up on the amount of equipment on hand. Now that the efficiency has been realized, and without the in-

stallation of large number of new cars, it is believed that the railways will have to resume buying to take care of ordinary replacements and the expansion of business.

During all of 1925, the carriers continued to report a substantial surplus of cars in good order. The surplus at its lowest point did not fall below 100,000 cars, although in October the carriers moved the largest volume of business—measured in net ton-miles—in their history. From the middle of March to the middle of July, the surplus continued to exceed 300,000 cars. It is believed that one factor of special importance was the situation in the bituminous coal industry, whereby, on account of the Jacksonville wage agreement production was concentrated in a small number of mines with resulting concentration of the car supply and more efficient use of the cars.

The buying movement that has existed more recently is attributed to two important causes. One is the record-breaking traffic. While it is true that for the ten-months period net ton-miles were only slightly in excess of those in the same period of 1920 or less than in the first ten months of 1923, it is also the case that the ton-miles in September were the largest for any September, and in October not only the heaviest for any October but also for any month in railway history. In September and October, furthermore, the carriers reported the largest net income for these months in their history.

A distinguishing feature of the year's business was the large proportion of the total freight car business that was placed by the railroads in the South and in the Southwest.

The list of orders which follows was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other owners of cars, in response to requests for this information. The data thus furnished was then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The figures of production were secured in response to requests made to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute in securing the reports of the companies affiliated with that organization.

In last year's annual review number, the following statement appeared:

"The *Railway Age* is not sufficiently optimistic as to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. It feels that such accuracy would be next to impossible in view of the short space of time permitted for the compilations due to the desirability of having the results available at the close of the year with which they deal. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly as concerns comparison with preceding years, which, after all, is the primary purpose of the compilations."

Freight Car Orders in 1924

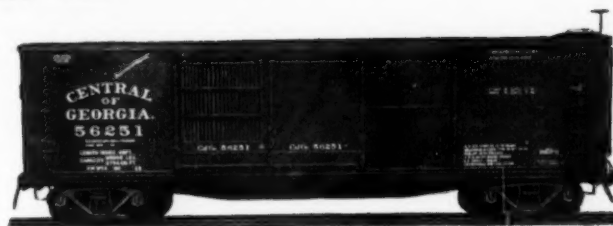
For Service in the United States

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date Order	Date of Delivery	Builder
American Bridge Co.....	6	Flat	100,000	40 0	St. Und'frame	38,600	February	June	Fressed Steel
American Gas & Electric Co.....	4	Dump	.....	.....	.....	.....	May	.....	Clark Car Co.
American Refr. Transit Co.....	5	Refrigerator	.....	.....	.....	.....	February	.....	Am. Car & Fdy.
American Rolling Mill Co.....	3	Ore	150,000	21 3	All Steel	49,160	February	April	Am. Car & Fdy.
American Extract Co.....	1	Tank	80,000	32 6	All Steel	.....	November	December	Am. Car & Fdy.
American Sheet & Tin Plate Co..	2	Dump	30 cu. yd.	.....	.....	.....	April	.....	Clark Car Co.
American Steel & Wire Co.....	14	Gondola	140,000	38 7	All Steel	47,200	January	April	Am. Car & Fdy.
	10	Dump	.....	.....	.....	.....	May	.....	Clark Car Co.

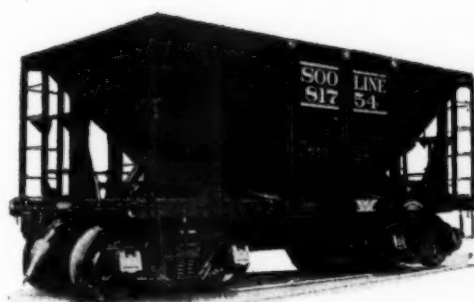
Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Archer-Daniels-Midland Lin. Des.	4	Compt. Tank	60,000	.....	All Steel	.....	May	.....	Standard Tank
	1	Compt. Tank	60,000	.....	All Steel	.....	May	.....	Standard Tank
	2	Compt. Tank	75,000	.....	All Steel	.....	May	.....	Standard Tank
Atchison, Topeka & Santa Fe.....	1	D. S. Box	80,000	40 6	Steel Frame	43,400	April	June	Pullman
	500	D. S. Auto	100,000	50 0½	Steel Frame	55,000	November	Mar., 1926	Pullman
	850	Gondola	100,000	40 0	Steel Frame	47,400	November	Mar.-May	Am. Car & Fdy.
	500	D. S. Box	100,000	40 6	Steel Frame	45,300	November	Mar.-Apr.	General American
	500	Refrigerator	70,000	39 11¾	St. Und'frame	57,000	November	Mar.-Apr.	Pullman
	500	Refrigerator	70,000	39 11¾	St. Und'frame	57,000	November	Mar.-Apr.	Am. Car & Fdy.
Atl. & West Pt., W. Ry. of Ala.	50	Gondola	60,000	32 4	St. Und'frame	35,800	January	February	W. of Ala. Shops
	50	Gondola	100,000	40 6	All Steel	44,800	May	December	W. of Ala. Shops
	282	S. S. Box	100,000	40 6	Steel Frame	44,200	November	Jan., 1926	Tenn., C. I. & R. R.
Atlanta, Birm. & Atlantic.....	257	Hopper	100,000	41 6	Composite	41,000	August	December	Va. Bridge & Iron
	100	Flat	80,000	41 0	Steel Frame	32,480	November	Feb., 1926	Va. Bridge & Iron
Atlantic Coast Line.....	500	S. S. Box	80,000	40 6	Steel Frame	43,100	May	July	Tenn., C. I. & R. R.
	200	Phosphate	100,000	33 0	All Steel	.....	May	December	Tenn., C. I. & R. R.
	750	Gondola	100,000	41 6	All Steel	.....	October	.....	Am. Car & Fdy.
	500	Gondola	100,000	41 6	All Steel	.....	November	.....	Am. Car & Fdy.
	30	Caboose	60,000	29 8¾	Steel Frame	40,500	August	October	Company Shops
	300	Hopper	100,000	32 10½	All Steel	43,800	December	Jan., 1926	Pressed Steel
	525	Box	80,000	40 6	Steel Frame	45,400	December	Jan., 1926	Pressed Steel
	100	Ballast	.....	.....	.....	.....	December	.....	Va. Bridge & Iron
Ault & Wiborg Co.....	1	Compt. Tank	10,000g.	.....	All Steel	.....	June	July	Pennsylvania Car
Babcock & Wilcox Co.....	1	Gondola	80,000	38 0	All Steel	.....	September	December	Am. Car & Fdy.
Baltimore & Ohio.....	2,000	Box Bods.	100,000	40 6	All Steel	46,300	January	June	Pullman
	2,500	Gondola	140,000	46 0	All Steel	51,700	January	August	Standard Steel
	500	Gondola	140,000	46 0	All Steel	51,700	January	July	General American
	1,000	Hopper	110,000	30 0	All Steel	40,500	September	December	Standard Steel
	1,000	D. S. Box	100,000	40 6	All Steel	46,300	September	December	Standard Steel
	1,000	D. S. Box	100,000	40 6	All Steel	46,300	September	December	Bethlehem Steel
	100	Caboose	.....	23 4¼	St. Und'frame	41,100	May	November	Company Shops
	1,000	Box	.....	.....	All Steel	.....	December	.....	Bethlehem Steel
	1,000	Box	.....	.....	All Steel	.....	December	.....	Standard Steel
Bangor & Aroostook.....	50	Flat	60,000	36 9	St. Und'frame	28,600	.....	.....	Company Shops
	175	S. S. Box	80,000	36 10½	St. Und'frame	40,300	.....	.....	Company Shops
	2	Caboose	.....	36 9	St. Und'frame	43,500	.....	.....	Company Shops
	1	Snow Plow	.....	.....	Wood	.....	October	November	Russell
Barnsdalle Ref. Co.....	1	Tank	3,050g.	.....	All Steel	.....	May	June	Pennsylvania Car
Bethlehem Steel Co.....	50	Flat	100,000	42 0	All Steel	40,000	April	October	Company Shops
Beth. Steel Co. (Lackawanna Plant)	30	Coke	100,000	45 0	All Steel	56,200	.....	September	Bethlehem Steel
Bd. of Co. Rd. Com. Wayne, Mich.	2	Flat	110,000	36 0	St. Und'frame	34,550	January	March	Am. Car & Fdy.
California Dispatch Line.....	5	Tank	10,000	32 6	All Steel	45,000	January	February	Am. Car & Fdy.
	5	Tank	8,000	.....	All Steel	42,000	January	March	Penn. Car Co.
Cambria & Indiana.....	2	Caboose	60,000	24 0½	.....	.....	November	.....	Standard Tank
Canfield Tank Line Co.....	16	Tank	80,000	.....	All Steel	45,400	April	May	Standard Tank
	17	Tank	80,000	.....	All Steel	45,300	April	May	Standard Tank
	18	Tank	100,000	.....	All Steel	45,500	April	May	Standard Tank
	19	Tank	80,000	.....	All Steel	44,700	April	May	Standard Tank
Carnegie Steel Co.	4	Gondola	140,000	33 8	All Steel	48,500	June	October	Canton Car Co.
	2	Flat	140,000	34 8	All Steel	49,100	January	March	Pressed Steel
	12	Condola	140,000	65 0	All Steel	67,300	January	April	Standard Steel
	50	Condola	100,000	34 0	All Steel	44,400	May	October	Pressed Steel
	4	Air Dump	100,000	26 8¾	All Steel	58,600	November	November	Clark Car Co.
	1	Air Dump	140,000	26 8¾	All Steel	69,300	November	November	Clark Car Co.
Central of Georgia.....	2,000	Vent. Box	80,000	40 0½	St. Und'frame	46,500	July-Oct.	Dec.-May, '26	Tenn., C. I. & R. R.
	10	Caboose	60,000	27 1½	St. Und'frame	38,400	January	March	Company Shops
	20	Caboose	60,000	27 1½	St. Und'frame	38,400	September	Feb., 1926	Company Shops
Central of New Jersey.....	1	Refrigerator	80,000	36 0	St. Und'frame	46,300	August	Jan., 1926	Company Shops
	1	Refrigerator	80,000	36 0	St. Und'frame	46,300	November	Apr., 1926	Company Shops
	1	Flat	60,000	36 0	St. Cen. Sills	29,400	November	Apr., 1926	Company Shops
	1	Caboose	60,000	26 0	St. Und'frame	32,900	April	June	Company Shops
	1	Caboose	60,000	26 0	St. Und'frame	33,400	June	August	Company Shops
	10	Air Dump	.....	.....	.....	.....	October	.....	Magor
Central Vermont.....	6	Caboose	.....	.....	St. Und'frame	.....	March	.....	Company Shops
	3	Tank	10,000g.	28 0	All Steel	43,300	July	August	Am. Car & Fdy.
	1	Hopper	20,000	18 0	All Steel	.....	November	Jan., 1926	Mt. Vernon
Certain-teed Products Corp.....	100	S. S. Box	80,000	40 6	Steel Frame	44,200	February	June	Tenn., C. I. & R. R.
Charleston & West. Carolina.....	100	Caboose	.....	24 0½	Steel Frame	41,400	September	Jan., 1926	Standard Tank
Chesapeake & Ohio.....	4	Air Dump	.....	.....	.....	.....	October	.....	Case Crane & Eng.
Chicago & Eastern Illinois.....	525	Gondola	110,000	40 9¾	Steel Frame	47,500	July	Apr., 1926	Company Shops
Chicago, Burlington & Quincy.....	500	Gondola	100,000	48 6	Steel Frame	46,000	March	August	West. Steel Car
	500	S. S. Auto	100,000	50 3	Steel Frame	53,900	January	June	Pullman
	1500	S. S. Auto	80,000	40 6	Steel Frame	44,500	January	July	Pullman
	300	Stock	80,000	36 1½	St. Cent. Sills	37,800	January	August	Company Shops
Chic., Ind. & Louisville.....	250	D. S. Box	80,000	36 0	St. Cent. Sills	38,800	January	July	Company Shops
	500	D. S. Box	80,000	36 0	St. Cent. Sills	43,000	March	July	Fullman
	250	Hopper	110,000	33 8	St. Und'frame	41,600	March	July	Fullman
Chicago, Milwaukee & St. Paul.....	500	S. S. Auto	80,000	40 6	St. Und'frame	46,300	May	Aug.-Sept.	Am. Car & Fdy.
	500	S. S. Auto	80,000	40 6	St. Und'frame	46,500	May	Aug.-Sept.	General American
	1,000	S. S. Box	80,000	40 6	St. Und'frame	43,200	May	Aug.-Oct.	Bettendorf
	1,000	S. S. Box	80,000	40 6	St. Und'frame	43,200	May	Aug.-Sept.	Pressed Steel
	1,000	S. S. Box	80,000	40 6	St. Und'frame	43,400	May	August	Pullman
	500	Stock	80,000	36 0	St. Und'frame	41,200	May	Sept.-Oct.	Ill. Car & Mfg.
	1,000	Stock	80,000	36 0	St. Und'frame	51,100	May	Aug.-Oct.	Standard Steel
	500	Gondola	100,000	48 6	St. Und'frame	41,500	May	Sept.-Nov.	Standard Tank
	500	Flat	100,000	45 0	St. Und'frame	39,100	May	Sept.-Oct.	Ryan Car Co.
Chic., Rock Island & Pac.....	1,200	S. S. Box	80,000	40 0	Steel Frame	.....	March	June-Aug.	Am. Car & Fdy.
	400	Coal	100,000	41 0	Steel Frame	.....	March	July-Aug.	Am. Car & Fdy.
	100	Gond. Bods.	100,000	41 7	St. Und'frame	.....	April	August	Am. Car & Fdy.
Chicago Tank Car Co.....	5	Tank	80,000	32 6	All Steel	.....	November	December	Am. Car & Fdy.
Cincinnati Northern	400	Box	110,000	40 6	All Steel	46,000	November	Jan., 1926	Am. Car & Fdy.
Cities Service Tank Line Co.....	66	Tank	10,000g.	.....	All Steel	.....	February	.....	Am. Car & Fdy.
	645	Tank	8,000g.	.....	All Steel	.....	February	.....	Am. Car & Fdy.
	2	Tank	6,000g.	.....	All Steel	.....	February	.....	Am. Car & Fdy.
	35	Tank	4,500g.	.....	All Steel	.....	February	.....	Am. Car & Fdy.
	35	Tank	4,500g.	.....	All Steel	.....	February	.....	Am. Car & Fdy.
	30	Tank	10,000g.	.....	All Steel	.....	May	.....	Standard Tank
	45	Tank	8,000g.	.....	All Steel	.....	May	.....	Standard Tank
	4	Tank	8,000g.	.....	All Steel	.....	July	.....	Gen. Amer. Tank

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Clev., Cinn., Chic. & St. Louis....	1,000	Box	110,000	40 6	All Steel	46,000	May	Mar.-May	Am. Car & Fdy.
	1,000	Gondola	110,000	41 6	All Steel	42,800	May	May-June	Am. Car & Fdy.
	500	Gondola	110,000	41 6	All Steel	42,800	May	May-July	Pullman
	300	Refrigerator	70,000	33 1	St. Und'frame	57,000	May	Oct.-Dec.	M. D. T. Co.
	1,000	Gondola	110,000	41 6	All Steel	43,000	November	Jan., 1926	Pullman
	500	Refrigerator	70,000	33 1	St. Und'frame	57,000	September	Jan., 1926	M. D. T. Co.
Columbia, Newberry & Laurens...	25	S. S. Box	80,000	40 0	Steel Frame	43,200	June	July	Tenn., C. I. & R. R.
Conemaugh & Black Lick.....	15	Gondola	140,000	46 0	All Steel	51,600	September	.....	Bethlehem Steel
Conley Tank Car Co.....	75	Tank	80,000	.....	All Steel	42,000	January	Feb.-Apr.	Am. Car & Fdy.
	25	Tank	80,000	.....	All Steel	47,400	January	Feb.-Apr.	Am. Car & Fdy.
	50	Tank	80,000	32 6	All Steel	42,000	January	Feb.-Apr.	Am. Car & Fdy.
	200	Tank	8,000g.	32 6	All Steel	.....	December	Mar., 1926	Am. Car & Fdy.
Cosden & Co.....	3	Tank	80,000	34 5	All Steel	.....	May	July	Am. Car & Fdy.
	8	Tank	80,000	32 6	All Steel	.....	August	October	Am. Car & Fdy.
Craig Oil Co.....	15	Tank	.....	.....	All Steel	.....	February	.....	Standard Tank
Crossett Lbr. Co.	30	Logging	60,000	.....	Wood	10,600	January	March	Am. Car & Fdy.
Crouse Clay Products.....	1	Hopper	110,000	22 11	All Steel	43,200	August	November	Mt. Vernon
Cudahy Refr. & Cudahy Oil Tank	200	Refrigerator	80,000	36 0	Steel Frame	52,000	April	October	General American
Cutter, Geo. Co.	1	Flat	80,000	40 0 3/4	St. Und'frame	33,300	August	October	Mt. Vernon
Delaware, Lackawanna & Western	1,000	D. S. Box	110,000	40 6	St. Und'frame	44,000	January	May-July	Am. Car & Fdy.
	300	Refrigerator	80,000	33 11	St. Und'frame	55,000	April	Aug.-Oct.	Am. Car & Fdy.
	25	Caboose	.....	24 2 3/4	St. Und'frame	40,000	May	November	Magor
	50	Stock	80,000	40 4 3/4	St. Und'frame	41,000	September	.....	Company Shops
	50	Flat	80,000	40 5 3/4	St. Und'frame	36,000	September	.....	Company Shops
	50	Ballast	.....	.....	.....	.....	December	.....	Rodger Ballast
Denver & Rio Grande Western....	200	D. S. Auto	100,000	50 0	St. Und'frame	.....	November	.....	Mt. Vernon
	500	Gondola	100,000	42 0	All Steel	49,400	November	1926	Pressed Steel
Detroit Edison Co.....	4	Gondola	100,000	40 6	All Steel	43,360	April	August	Pressed Steel
Detroit, Tol. & Ironton.....	40	Caboose	60,000	23 5	Steel Frame	38,000	April	May	Standard Steel
	50	Flat	140,000	42 10 3/4	All Steel	58,000	April	July	Standard Steel
	400	Gondola	100,000	41 6	All Steel	40,000	April	June	Standard Steel
	20	Ballast	100,000	41 6	St. Und'frame	40,000	March	July	Mt. Vernon
	1	Gondola	100,000	41 6	All Steel	40,000	April	June	Standard Steel
	20	Dump	30 cu. yd.	.....	.....	.....	April	.....	Clark Car Co.
Dierks Lumber & Coal Co.....	25	Log. Flat	80,000	40 0	.....	.....	November	Feb., 1926	Am. Car & Fdy.
Dow Chemical Co.	1	Tank	10,000g.	32 6	All Steel	44,800	March	April	Am. Car & Fdy.
Du Pont, E. I., De Nemours.....	22	Tank	50,000	.....	All Steel	.....	September	.....	Gen. Amer. Tank
Electro Bleaching Gas Co.....	15	Tank	30,000	.....	All Steel	.....	November	.....	Gen. Amer. Tank
Enterprise Ry. Equip. Co.....	1	Gen. Ser.	100,000	41 0	All Steel	54,600	October	.....	Bethlehem Steel
	1	Gondola	100,000	41 6	St. Und'frame	57,900	February	July	Mt. Vernon
Everett Distilling Co.	10	Tank	100,000	32 6	All Steel	43,700	February	March	Am. Car & Fdy.
Falling Rock Cannel Coal Co.....	3	Tank	80,000	32 6	All Steel	47,300	January	February	Am. Car & Fdy.
Fisher Hurd Lumber Co.....	40	Logging	60,000	20 0	All Wood	15,500	July	Sept.-Oct.	Am. Car & Fdy.
Florida East Coast.....	20	Caboose	.....	33 10	St. Und'frame	53,000	Dec., 1924†	October	Magor
†Not included in 1924 tabulation.									
Foley Bros.	1	Auto Box	100,000	.....	St. Und'frame	.....	.....	.....	General American
Ford Motor Co.	75	Gen. Service	110,000	39 11	All Steel	48,500	April	July	Standard Steel
	6	Gen. Service	110,000	41 6	All Steel	39,400	June	June	Standard Steel
Ford Transportation Co.	20	Gondola	100,000	41 6	St. Und'frame	59,800	February	July	Mt. Vernon
Ft. Worth & Denver City.....	25	Stock	60,000	36 6	St. Und'frame	33,800	May	October	Company Shops
Fruit Growers Express.....	56	Refrigerator	60,000	32 6	St. Cent. Sills	47,000	June	December	Company Shops
	195	Refrigerator	60,000	32 6	St. Cent. Sills	51,400	June	October	Company Shops
	20	Refrigerator	60,000	32 6	St. Cent. Sills	51,400	June	December	Company Shops
	14	Refrigerator	60,000	33 2 3/4	St. Und'frame	52,500	August	December	Company Shops
	100	Refrigerator	60,000	32 6	St. Cent. Sills	48,100	September	December	Company Shops
	6	Refrigerator	60,000	32 6	St. Cent. Sills	48,100	September	December	Company Shops
General Electric Co.	2	Dump	30 cu. yd.	.....	All Steel	.....	June	.....	Clark Car Co.
General Equipment Co.	10	Flat	100,000	36 0	St. Und'frame	18,300	April	July	Am. Car & Fdy.
Gen'l Refractories Co.	20	Hopper	.....	16 6	All Steel	12,400	February	July	Am. Car & Fdy.
Georgia, Fla. & Ala.	280	S. S. Box	80,000	.....	St. Und'frame	.....	.....	December	General American
Georgia Pine Turpentine Co.....	1	Tank	8,000g.	.....	.....	.....	September	September	Gen. Amer. Tank
Gillespie, L. C., & Sons.....	3	Tank	80,000	32 6	All Steel	.....	October	November	Am. Car & Fdy.
Glen Nina Tank Line.....	2	Comp. Tank	6,000g.	.....	All Steel	.....	August	.....	Standard Tank
	1	Comp. Tank	6,000g.	.....	All Steel	.....	September	.....	Standard Tank
Grasselli Dyestuff Corp.	1	Tank	100,000	32 6	All Steel	51,900	March	May	Am. Car & Fdy.
Great Northern	200	Flat	100,000	50 0	Steel Frame	40,800	.....	.....	Company Shops
	95	S. S. Auto	100,000	50 6	Steel Frame	56,200	.....	.....	Company Shops
	5	S. S. Auto	140,000	50 6	Steel Frame	58,400	.....	.....	Company Shops
	2	Well	80,000	40 0	All Steel	52,500	.....	.....	Company Shops
	25	Caboose	.....	25 0	St. Und'frame	35,080	.....	.....	Company Shops
	1,000	Box	80,000	40 0	St. Und'frame	42,700	.....	.....	Company Shops
	500	Gen. Ser.	100,000	41 0	All Steel	51,600	September	Spring, '26	Bethlehem Steel
Green Bay & Western.....	150	S. S. Box	80,000	40 6	Steel Frame	43,100	May	September	West. St. Car
	50	S. S. Box	80,000	40 6	Steel Frame	45,700	May	September	General American
Gulf, Mobile & Northern.....	20	S. S. Box	80,000	40 0	St. Und'frame	42,300	May	June	Company Shops
	20	S. S. Box	80,000	40 0	St. Und'frame	42,300	May	July	Company Shops
	20	S. S. Box	80,000	40 0	St. Und'frame	42,300	June	August	Company Shops
	10	S. S. Box	60,000	35 10	All Wood	36,000	August	October	Company Shops
	20	S. S. Box	60,000	35 10	All Wood	36,000	August	September	Company Shops
	5	Flat	80,000	40 0	All Wood	32,000	January	August	Company Shops
	5	Flat	80,000	40 0	All Wood	32,000	April	August	Company Shops
	3	Flat	80,000	40 0	All Wood	32,000	October	December	Company Shops
Guthrie, A., & Co.....	16	Ore	150,000	20 1 1/2	All Steel	41,300	April	July	Bethlehem Steel
	6	Air Dump	100,000	.....	.....	.....	March	.....	Koppel

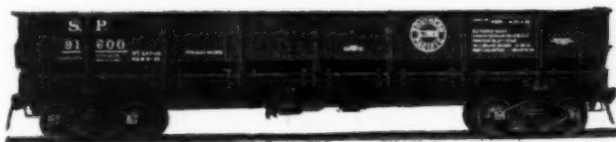
Central of Georgia 40-Ton Double Sheathed Ventilated Box Car, Built by the Tennessee Coal, Iron and Railroad Company



D. L. & W. 40-Ton Refrigerator Car, Built by the American Car & Foundry Company

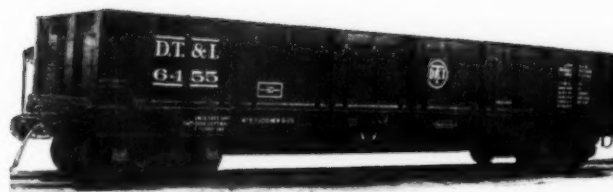


M. St. P. & S. Ste. Marie Ore Car of 75 Tons Capacity, Built by American Car & Foundry Company



Southern Pacific 50-Ton General Service Gondola, Built by the Tennessee Coal, Iron & Railroad Company

Fifty-Ton Composite Gondola Car, Built by the Mount Vernon Car Manufacturing Company for the Detroit, Toledo & Ironton



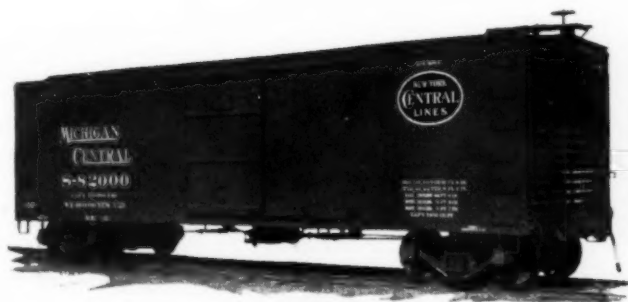
Fifty-Ton Composite Gondola Car, Built for the C. B. & Q., by the Western Steel Car & Foundry Company

Freight Cars Ordered During 1925

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Hainesport Mining & Trans. Co...	6	Hopper	100,000	24 5	All Steel	37,250	September	October	Am. Car & Fdy.
Heinz, H. J. Co.....	10	Pickle	.....	.....	.....	.....	.....	September	General American
Hercules Gasoline Co.....	10	Tank	10,050g.	.....	All Steel	.....	April	.....	Standard Tank
Hocking Valley	25	Caboose	.....	24 0 1/4	Steel Frame	41,400	September	Feb., 1926	Company Shops
Hooker Electro Chemical Co.....	5	Tank	30,000	32 6	All Steel	44,800	January	March	Am. Car & Fdy.
	4	Tank	60,000	42 3	All Steel	30,100	June	June	Am. Car & Fdy.
	5	Tank	30,000	32 6	All Steel	44,800	May	July	Am. Car & Fdy.
	5	Tank	30,000	32 6	All Steel	44,800	June	July	Am. Car & Fdy.
	5	Tank	30,000	32 6	All Steel	44,800	September	September	Am. Car & Fdy.
	10	Tank	30,000	32 6	All Steel	44,800	September	November	Am. Car & Fdy.
Hubbard & Co.	2	S. S. Box	100,000	40 6	All Steel	46,600	October	.....	Bethlehem Steel
Hudson & Manhattan.....	1	Flat	60,000	41 0	St. Und'frame	.....	May	August	Am. Car & Fdy.
Huron Portland Cement Co.....	5	Ore	100,000	24 9	All Steel	41,000	February	June	Nat'l Dump Co.
Illinois Central	500	Automobile	80,000	40 6	Steel Frame	47,000	September	Dec.-Jan.	Pullman
	500	Automobile	80,000	40 6	Steel Frame	47,000	September	Jan.-Feb.	Am. Car & Fdy.
	200	D. D. Stock	80,000	40 6 1/4	Steel Frame	41,500	October	Feb., 1926	General American
	200	Flat	100,000	40 8	Steel Frame	36,500	October	Feb., 1926	Standard Steel
Illinois Traction	50	Gondola	100,000	34 6	St. Und'frame	43,200	April	September	Mt. Vernon
	50	Gondola	100,000	34 6	St. Und'frame	43,500	August	October	Mt. Vernon
Indian Refining Co.	10	Compt. Tank	6,000g.	.....	All Steel	.....	October	.....	Standard Tank
Inland Steel Co.	50	Air Dump	140,000	.....	.....	.....	February	.....	West. Wh. Scraper
	10	Flat	150,000	.....	All Steel	.....	.....	.....	General American
International-Gt. Northern	750	S. S. Box	80,000	40 6	St. Und'frame	44,000	November	.....	Am. Car & Fdy.
	250	S. S. Auto	80,000	40 6	St. Und'frame	45,000	November	.....	Standard Tank
Interstate	150	Gondola	100,000	36 9	All Steel	38,000	September	Oct.-Dec.	Va. Bridge & Iron
Interstate Pub. Ser. Co.	6	Ballast	80,000	40 0	St. Und'frame	37,300	July	September	Am. Car & Fdy.
Ireland, H. B.	250	Stock	60,000	.....	St. Und'frame	.....	.....	July-Aug.	General American
	100	Refrigerator	100,000	.....	.....	.....	.....	June	General American
	150	Refrigerator	80,000	.....	St. Und'frame	.....	.....	.....	General American
	100	Refrigerator	80,000	.....	St. Und'frame	.....	.....	Oct.-Nov.	General American
	200	Refrigerator	80,000	.....	St. Und'frame	.....	.....	September	General American
Iroquois Gas Corp.	2	Hopper	110,000	30 0	All Steel	38,700	June	September	Am. Car & Fdy.
	2	Gondola	100,000	38 3 1/2	Steel Frame	45,500	June	September	Am. Car & Fdy.
Iseo Chemical Co.	1	Tank	8,000g.	.....	All Steel	.....	September	.....	Standard Tank
Kanawha, Glen Jean & East.....	100	Gondola	110,000	40 0	All Steel	42,500	September	Dec., 1926	Standard Steel
Kanotex Refining Co.	200	Tank	80,000	32 6	All Steel	.....	December	Feb., 1926	Am. Car & Fdy.
Kansas City Southern	1	Scale Test	80,000	15 0 1/4	Steel Frame	80,000	May	September	Southwark Fdy.
King Chemical Co.	1	Tank	40,000	.....	All Steel	.....	August	.....	Gen. Amer. Tank
Laclede Steel Co.....	1	Dump	30 cu. yd.	.....	.....	.....	April	.....	Clark Car Co.
Lake Shore Elec. Ry.	20	Box	80,000	.....	St. Und'frame	.....	December	Mar., 1926	Am. Car & Fdy.
Lehigh Valley	500	S. S. Auto	100,000	42 3	All Steel	.....	December	Mar., 1926	Am. Car & Fdy.
	500	Hopper	140,000	.....	All Steel	.....	December	.....	Bethlehem Steel
	100	Gondola	140,000	.....	.....	.....	December	.....	Bethlehem Steel
Lima, Toledo R. R.	10	Box	60,000	47 9	Steel Frame	40,100	August	October	Am. Car & Fdy.
Litchfield & Madison.....	50	Hopper	110,000	30 6	All Steel	38,000	October	.....	Ryan Car Co.
Live Poultry Transit Co.....	100	Poultry	40,000	36 0	All Steel	51,000	September	November	New City Car Co.
Long Island	20	Air Dump	40 cu. yd.	.....	.....	.....	May	.....	Goodwin Car & Mfg.
Los Angeles & Salt Lake.....	5	Dump	20 yd.	26 0	All Steel	55,800	April	June	West. Wh. Scraper
Louisville & Nashville.....	1,500	D. B. Gond.	100,000	40 6	All Steel	43,200	October	1926	Pressed Steel
	500	S. S. Box	100,000	40 6	St. Und'frame	44,600	October	1926	Standard Tank
	250	Flat	100,000	45 0	St. Und'frame	44,500	October	1926	Bethlehem Steel
	1,000	Gondola	100,000	.....	All Steel	.....	December	1926	Pressed Steel
Luzerne Co. Gas & Elec. Co.....	1	Hopper	110,000	30 5	All Steel	39,300	October	Jan., 1926	Am. Car & Fdy.
Mathieson Alkali Works, Inc.....	2	Glass Tank	8,000g.	32 6	All Steel	100,000	February	June	Am. Car & Fdy.
	20	Mult. Tank	30,000	32 6	All Steel	.....	February	August	Am. Car & Fdy.
	10	Glass Tank	30,000	32 6	All Steel	.....	May	December	Am. Car & Fdy.
	10	Tank	100,000	32 6	All Steel	43,800	June	July	Am. Car & Fdy.
Madeira, Hill & Co.	7	Dump	30 cu. yd.	.....	.....	.....	June	.....	Clark Car Co.
Magnolia Petroleum Co.	50	Tank	100,000	.....	All Steel	52,000	February	March	Am. Car & Fdy.
Maine Central	2	S. S. Box	100,000	40 6	All Steel	45,500	February	May	Standard Steel
Merchants Despatch, Inc.	500	Refrigerator	70,000	33 3	St. Und'frame	56,000	March	December	Mer. Des. Trans. Co.
	1,000	Refrigerator	70,000	33 3	St. Und'frame	56,000	August	.....	Mer. Des. Trans. Co.
Michigan Central	300	Flat	80,000	40 0	St. Und'frame	32,800	June	July-Nov.	Ill. Car & Mfg.
	200	Flat	80,000	40 0	St. Und'frame	32,800	October	Jan.-Feb.	Ill. Car & Mfg.
	500	Gondola	110,000	41 6	All Steel	42,800	November	Feb., 1926	Ill. Car & Mfg.
	50	Ballast	100,000	40 0	All Steel	46,600	May	November	Am. Car & Fdy.
Mid-Continent Pet. Corp'n.....	3	Tank	80,000	32 6	All Steel	41,600	May	July	Am. Car & Fdy.
	8	Tank	80,000	32 6	All Steel	41,300	August	October	Am. Car & Fdy.
Miller Bros.	1	Flat	60,000	60 0	All Wood	36,000	May	May	Mt. Vernon
	1	Flat	60,000	70 0	St. Und'frame	53,200	May	July	Mt. Vernon
Minn., St. Paul & S. Ste. Marie...	125	Ore	150,000	19 9 1/4	All Steel	41,500	March	June	Pullman
	125	Ore	150,000	19 9 1/4	All Steel	41,500	March	July	Am. Car & Fdy.
Missouri-Kansas-Texas	1,000	S. S. Box	100,000	40 6	Steel Frame	46,100	August	Nov.-Mar.	Mt. Vernon
	500	S. S. Box	100,000	40 6	Steel Frame	46,100	October	1st half 1926	Company Shops
Missouri Pacific	375	Gondola	100,000	41 6	St. Und'frame	45,700	Dec., 1924†	March	Pullman
	375	Gondola	100,000	41 6	St. Und'frame	45,700	Dec., 1924†	May-July	Penn. Car Co.
	250	Hopper	110,000	30 6	All Steel	43,300	Dec., 1924†	.....	Standard Steel
	250	S. S. Auto	100,000	50 6	St. Und'frame	57,700	November	.....	Am. Car & Fdy.
	500	S. S. Box	80,000	40 6	St. Und'frame	44,000	November	.....	General American
	250	S. S. Box	80,000	40 6	St. Und'frame	44,000	November	.....	Am. Car & Fdy.
	250	Hopper	110,000	30 6	All Steel	43,300	November	.....	Am. Car & Fdy.
	250	S. S. Stock	80,000	40 6	St. Und'frame	42,000	November	.....	Penn. Car Co.
	500	S. S. Box	100,000	40 6	St. Und'frame	50,000	November	.....	Standard Tank
Missouri Portland Cement Co.....	10	Hopper	100,000	.....	.....	.....	July	.....	Am. Car & Fdy.
	10	Hopper	100,000	30 6	All Steel	41,600	July	September	Am. Car & Fdy.
Montour	500	Hopper	110,000	30 6	All Steel	40,000	October	December	Standard Steel

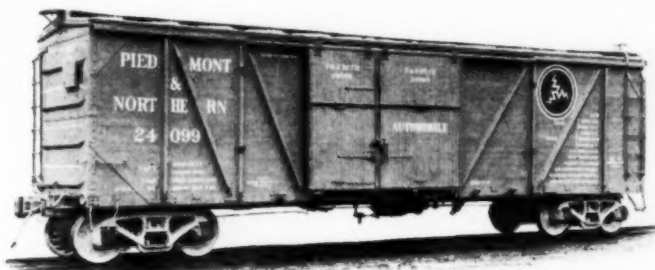
† Not included in 1924 tabulations.

Single Sheathed, 40-Ton Box Car, Built for the C. M. & St. P. by the Western Steel Car & Foundry Company



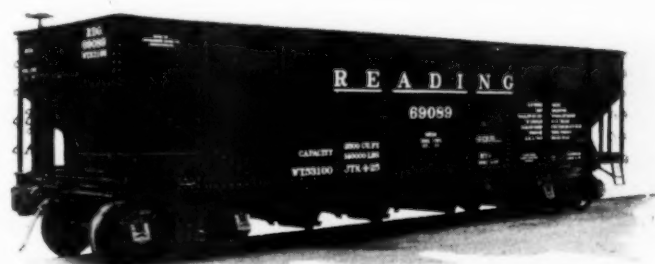
50-Ton Steel Box Car, Built for the New York Central by the Standard Steel Car Company

Single Sheathed, 50-Ton Automobile Car, Built for the Piedmont & Northern by the Pressed Steel Car Company



40-Ton Steel Frame Stock Car, Built for the C. M. & St. P. by the Standard Steel Car Company

70-Ton All-Steel Hopper Car, Built for the Reading by the Bethlehem Steel Company



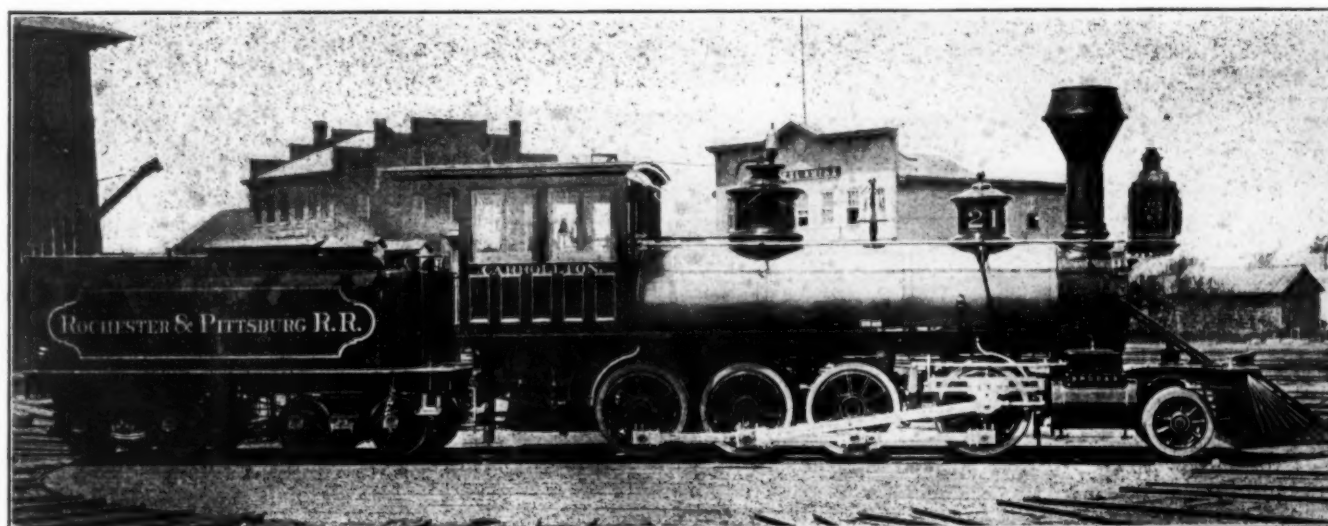
95-Ton All-Steel Ore Car, Built for the Duluth, Missabe & Northern by the American Car & Foundry Company

Selection of Some of the Important 1925 Freight Car Orders

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Morrell Refrigerator Line.....	100	Refrigerator	80,000	36 0	St. Cent. Sills	56,000	February	May	Am. Car & Fdy.
National Ammonia Co.	2	Tank	80,000	.....	All Steel	.....	May	.....	Am. Car & Fdy.
National Plate Glass Co.....	24	Hopper	140,000	28 5½	Steel Frame	.....	March	.....	Bettendorf
National Tube Co.	50	Hopper	110,000	30 6	All Steel	42,700	November	Jan., 1926	Greenville
New York Central.....	400	H. S. Gond.	100,000	41 6	All Steel	44,000	February	December	M. D. T. Co.
	200	Refrigerator	70,000	33 3	St. Und'frame	56,700	March	October	M. D. T. Co.
	500	H. S. Gond.	100,000	41 6	All Steel	43,700	July	Mar., 1926	Company Shops
	500	Refrigerator	70,000	33 3	St. Und'frame	56,700	September	Feb., 1926	M. D. T. Co.
	500	H. S. Gond.	110,000	41 6	All Steel	42,600	November	.....	Standard Tank
	500	H. S. Gond.	110,000	41 6	All Steel	42,900	November	.....	General American
	1,500	D. S. Box	110,000	40 6	All Steel	46,500	November	.....	Am. Car & Fdy.
	550	Hopper	110,000	30 6	All Steel	42,400	December	Feb., 1926	Ralston
	500	Automobile	.....	.....	.....	.....	December	.....	Standard Steel
	500	Hopper	110,000	30 6	All Steel	43,100	December	1926	Pressed Steel
N. Y. Rapid Trans. Corp'n.....	2	Flat	60,000	48 0	St. Und'frame	37,900	May	October	Am. Car & Fdy.
Norfolk & Western.....	788	Gond. Bods.	110,000	38 7½	All Steel	40,500	January	February	Ralston
	934	Hop. Bods.	110,000	30 0½	All Steel	41,700	May	July	Ralston
	806	Gond. Bods.	115,000	38 7	All Steel	40,500	January	Apr.-Nov.	Va. Bridge & Iron
	1,000	Hop. Bods.	.....	.....	All Steel	.....	May	.....	Am. Car & Fdy.
Northan, M. K.	5	Tank	80,000	.....	All Steel	.....	August	.....	Am. Car & Fdy.
Northern Pacific	500	Box	80,000	40 9	Steel Frame	44,900	January	Apr.-June	Pullman
	500	D. S. Box	80,000	40 9	Steel Frame	44,600	January	May-July	Pac. Car & Fdy.
Northern Refr. Car Co.....	200	Refrigerator	60,000	33 2¾	St. Und'frame	56,400	.....	.....	Pullman
Northwestern Refrig. Line.....	200	Refrigerator	80,000	.....	St. Und'frame	.....	December	April	Am. Car & Fdy.
Ohio Valley Refining Co.....	1	Compt. Tank	8,000g.	.....	All Steel	.....	June	.....	Standard Tank
Pacific Fruit Express.....	128	Refrigerator	60,000	39 10¾	St. Und'frame	53,700	June	Sept.-Oct.	Pac. Car & Fdy.
Pac. Nitrogen Corp'n.....	2	Tank	30,000	32 6	All Steel	66,200	May	July	Am. Car & Fdy.
Palace Poultry Car Co.....	50	Poultry	60,000	36 6	Steel Frame	58,000	December	March 1, 1926	Ill. Car & Mfg.
Pan Amer. Petroleum Co.....	15	Tank	100,000	32 6	All Steel	.....	December	February	Am. Car & Fdy.
Pennsylvania	6	Poling	.....	25 2	St. Und'frame	51,000	May	October	Company Shops
Penn. Salt Mfg. Co.....	10	Tank	100,000	32 6	All Steel	41,600	January	April	Am. Car & Fdy.
	10	Tank	100,000	32 6	All Steel	41,600	March	May	Am. Car & Fdy.
	5	Tank	30,000	32 6	All Steel	46,000	July	September	Am. Car & Fdy.
	10	Tank	30,000	32 6	All Steel	.....	December	Feb., 1926	Am. Car & Fdy.
Pennsylvania Tank Line.....	3	Tank	8,050g.	.....	All Steel	.....	January	Jan.-Feb.	Pennsylvania Car
	2	Compt. Tank	8,050g.	.....	All Steel	.....	May	July	Pennsylvania Car
	2	Tank	8,050g.	.....	All Steel	.....	August	August	Pennsylvania Car
	100	Tank	8,050g.	.....	All Steel	.....	November	December	Pennsylvania Car
	120	Tank	8,050g.	.....	All Steel	.....	November	.....	Pennsylvania Car
	130	Tank	8,050g.	.....	All Steel	.....	November	.....	Pennsylvania Car
	50	Tank	8,050g.	.....	All Steel	.....	November	.....	Pennsylvania Car
Peoria & Eastern.....	100	S. S. Box	110,000	.....	All Steel	.....	November	.....	Am. Car & Fdy.
	9	D. D. Stock	60,000	38 4	St. Und'frame	40,000	January	Jan.-Feb.	Company Shops
	15	S. D. Stock	60,000	38 4	St. Und'frame	35,800	January	Jan.-Aug.	Company Shops
	3	Flat	80,000	40 0	St. Und'frame	33,000	January	Jan.-Sept.	Company Shops
Phil. Elec. Co.	1	Flat	100,000	40 0	St. Und'frame	38,260	August	November	Pressed Steel
Phillips Petroleum Co.....	300	Tank	80,000	.....	All Steel	48,000	July	October	Standard Tank
Piedmont & Northern.....	150	S. S. Box	100,000	40 6	Steel Frame	46,300	March	July-Aug.	Pressed Steel
Pittsburgh & Lake Erie.....	500	Hopper	140,000	39 0	All Steel	51,075	September	1926	Pressed Steel
	500	Hopper	140,000	39 0	All Steel	51,075	September	1926	Standard Steel
	4	Dump	140,000	32 2	All Steel	61,300	March	July	Clark Car Co.
Pittsburgh & West Virginia.....	400	Gondola	110,000	30 6	All Steel	41,000	December	December	Pressed Steel
	300	Gondola	100,000	45 11¼	St. Und'frame	49,000	December	1926	Pressed Steel
	300	Gondola	.....	.....	.....	.....	December	.....	Canton Car Co.
Pittsburgh Plate Glass Co.....	4	Gondola	140,000	46 0	All Steel	49,900	March	March	Standard Steel
Quaker City Tank Line.....	200	Tank	100,000	.....	All Steel	46,000	January	April	Am. Car & Fdy.
	100	Tank	100,000	.....	All Steel	48,000	January	April	Standard Tank
	100	Tank	80,000	.....	All Steel	42,000	January	April	Standard Tank
	100	Tank	100,000	.....	All Steel	43,000	May	June	Standard Tank
	250	S. D. Stock	60,000	36 0	All Steel	35,000	March	June	General American
	100	Refrigerator	80,000	36 0	St. Und'frame	52,000	March	June	General American
	200	Refrigerator	80,000	36 0	St. Und'frame	55,000	May	October	General American
	100	Refrigerator	80,000	36 0	St. Und'frame	55,000	June	October	General American
	250	Tank	100,000	.....	All Steel	48,000	August	November	General American
	158	Tank	80,000	.....	All Steel	42,000	August	November	General American
	150	Refrigerator	80,000	36 6	St. Und'frame	57,000	September	Jan., 1926	General American
Rajah Oil & Refining Co.....	10	Tank	10,000g.	.....	All Steel	.....	November	.....	Standard Tank
Reading	10	Caboose	.....	24 4¾	All Steel	44,900	October	July, 1926	Company Shops
	250	Gondola	140,000	46 0	All Steel	51,250	December	1926	Pressed Steel
	250	Gondola	140,000	.....	All Steel	.....	December	.....	Standard Steel
	500	Gondola	140,000	.....	All Steel	.....	December	.....	Bethlehem Steel
Red River & Gulf.....	1	Caboose	60,000	28 0	St. Und'frame	.....	November	Feb., 1926	Mt. Vernon
Rossville Co.	5	Tank	80,000	32 6	All Steel	.....	August	November	Am. Car & Fdy.
St. Louis-San Francisco.....	500	Gondola	110,000	41 6	St. Und'frame	.....	October	Mar., 1926	Tenn., C. I. & R. R.
	500	S. S. Auto	80,000	40 6	St. Und'frame	.....	November	Mar., 1926	Mt. Vernon
	500	S. S. Auto	100,000	40 6	Steel Frame	.....	November	.....	Pullman
	2,000	Box	100,000	40 7	Steel Frame	.....	November	Feb., 1926	Am. Car & Fdy.
	500	S. S. Box	100,000	.....	St. Und'frame	.....	November	Feb., 1926	General American
Seaboard Air Line.....	30	Caboose	.....	30 0	All Steel	42,000	August	December	Newport News
Shippers' Car Line, Inc.....	150	Tank	100,000	32 6	All Steel	44,500	June	June	Am. Car & Fdy.
Sinclair Refining Co.	50	Tank	10,000g.	.....	All Steel	.....	October	.....	Gen. Am. Tank
	1	Tank	100,000	32 6	All Steel	.....	October	October	Am. Car & Fdy.
Sloss-Sheffield S. & I. Co.....	75	Hopper	110,000	30 6	All Steel	40,000	March	May	Tenn., C. I. & R. R.
	35	Gondola	110,000	.....	All Steel	.....	March	.....	Tenn., C. I. & R. R.
Southern Manganese Corp'n.....	1	Tank	100,000	32 6	All Steel	.....	November	Feb., 1926	Am. Car & Fdy.
Southern Pacific	400	Ballast	100,000	30 4	All Steel	.....	February	July	Rodger Ballast

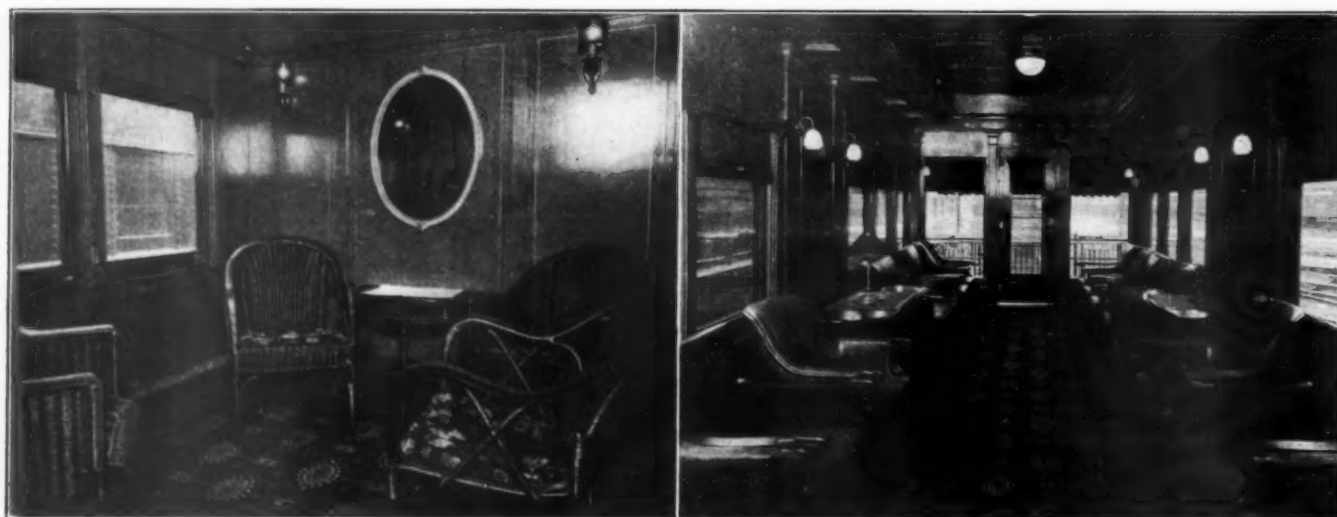
Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
	2,000	S. S. Box	100,000	40 6	St. Und'frame	43,800	April	December	Standard Steel
	200	S. S. Auto	100,000	50 3	St. Und'frame	51,000	April	December	Standard Steel
	1,000	Gondola	100,000	41 6	All Steel	46,800	April	November	Tenn., C. I. & R. R.
	200	Tank			All Steel		April		Penn. Car Co.
So. Pacific (La. & Tex. Lines)....	150	S. S. Box	100,000	40 6	St. Und'frame	44,650	May	December	Company Shops
	30	Caboose		29 7	St. Und'frame	39,000	May	October	Company Shops
Southern Pacific (Pac. System) ...	500	Box	100,000				March		Company Shops
	50	Caboose			St. Und'frame		March		Company Shops
Standard Oil Co. of N. J.	15	Tank	10,000g.		All Steel		March		Am Car & Fdy.
Stauffer Chemical Co.	1	Tank	80,000	32 6	All Steel	41,200	March	April	Am Car & Fdy.
Sun Oil Co.	100	Tank	6,500g.				November		Standard Tank
Swift & Co.	150	D. D. Stock	60,000	40 0	Steel Frame	35,000	February	April	Ill. Car & Mfg.
	300	Refrigerator					March		Company Shops
Tennessee Coal, Iron & R. R.	18	Flat	140,000	40 0	St. Und'frame	56,000	August	December	Company Shops
	4	Flat	140,000	40 0	St. Und'frame	50,300	August	December	Company Shops
	5	Dump	30 cu. yd.				June		Clark Car Co.
Texas & Pacific.....	750	Gondola	100,000	41 6	All Steel	45,000	August	Nov.-Dec.	West. St. Car
Tidal Refining Co.	60	Tank	80,000		All Steel		April	July	Gen. Amer. Tank
	125	Tank	80,000	32 6	All Steel		September	November	Am. Car & Fdy.
Transcontinental Oil Co.	4	Tank	80,000	32 6 3/4	All Steel	43,600	April	May	Am. Car & Fdy.
Union	15	Caboose	60,000	18 11 3/4	St. Und'frame	42,200	August		Pressed Steel
Union Pacific	500	Flat	100,000	40 10	All Steel	33,700	February	June-July	Standard Steel
	500	Gondola	100,000	48 6	All Steel	47,300	February	June-July	Pressed Steel
	1	Box	100,000	40 6	Steel Frame	45,200	March	September	General American
	25	Dump	30 cu. yd.		All Steel	58,400	September	September	Clark Car Co.
Union Refrig. Transit Co.	30	Refrigerator	80,000	32 9 3/4	St. Und'frame	57,000	March	July-Dec.	Company Shops
	2	Refrigerator	80,000	40 8	Steel Frame	62,000	March	July	Am. Car & Fdy.
	400	Refrigerator	80,000	40 0	St. Und'frame		December	March	Am. Car & Fdy.
United Electrical Coal Co.	30	Dump			All Steel		May		Am. Car & Fdy.
United States Gypsum Co.	12	Dump	30 cu. yd.						Koppel Industrial
U. S. Navy Dept.	1	Hopper	110,000				June		Pressed Steel
U. S. Stores Co.	5	Ore	16,000	10 0	All Steel	8,200	January	May	Mt. Vernon
Utah Copper Co.	25	Dump	30 cu. yd.					April	Clark Car Co.
Vacuum Oil Co.	4	Hopper	110,000	30 4	All Steel	38,700	February	May	Am. Car & Fdy.
Valvoline Oil Co.	10	Tank	8,000g.		All Steel		October		Standard Tank
	5	Tank	80,000	32 6	All Steel		November	December	Am. Car & Fdy.
Verde Tun. & Smelting Co.	15	Ore	150,000	23 10 3/4	All Steel		February	August	Pressed Steel
Virginia-Carolina Chem. Co.	1	Tank	7,000g.		All Steel		June		Am. Car & Fdy.
Virginia Smelting Co.	1	Tank	40,000		All Steel		March	April	Gen. Amer. Tank
	3	Tank	40,000	32 6	All Steel	47,600	June	September	Am. Car & Fdy.
Virginian	485	Gondola	240,000	49 6	All Steel	78,000	May	July-Oct.	Va. Bridge & Iron
Wabash	1,015	S. S. Auto	80,000	40 6	Steel Frame	47,000	November	May, 1926	Am. Car & Fdy.
	700	S. S. Auto	80,000	40 6	St. Und'frame	47,000	November	2nd qr. '26	Standard Steel
	300	S. S. Auto	80,000	40 6	St. Und'frame	47,000	November	2nd qr. '26	Streator Car
	12	Box	80,000	42 0	St. Und'frame	45,500	August	December	Am. Car & Fdy.
	12	Box		40 9	St. Und'frame	40,400	October	Jan., 1926	Am. Car & Fdy.
Waite Phillips Co.	50	Tank	80,000	36 3	All Steel	48,200	February	March	Standard Tank
Western Electric Co.	2	Flat	60,000	36 0	Steel Frame		July	December	Bettendorf
Western Pacific	7	Stock	80,000	36 6 1/2	Steel Frame	37,700	Dec., 1924†	April	Pac. Car & Fdy.
Western Paper Makers' Chem. Co. .	2	Tank	100,000				June		Standard Tank
	3	Tank	8,000g.				July		Standard Tank
	1	Tank	8,000g.	32 6	All Steel	41,700	August	September	Am. Car & Fdy.
White Star Refining Co.	53	Tank	10,000g.		All Steel	45,600	July	September	Standard Tank
Wichita Falls & Southern.....	50	Box	80,000	40 8	Steel Frame		December	May, 1926	Am. Car & Fdy.
Woodward Iron Co.	5	Dump	100,000	38 0	All Steel	68,500	May	May	Clark Car Co.

† Not included in 1924 tabulation.

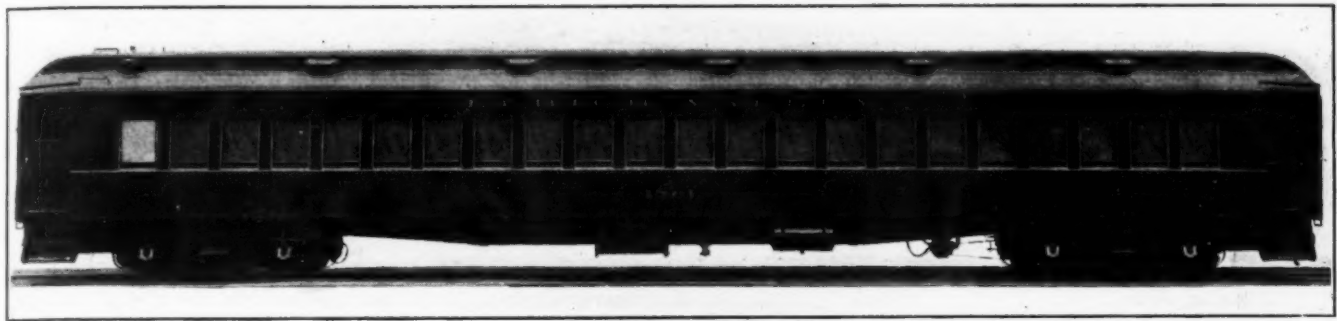


Built in 1882 by Brooks

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Misc. Oil Co., names not supplied.	280	Tank	.....	.....	All Steel	.....	.....	.....	General American
Various Purchasers, Names not supplied	620	Skeleton Flat	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
	10	Special	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
	7	Ballast	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
	74	Logging	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
	42	Flat	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
	3	Cabooses	.....	.....	.....	.....	.....	.....	Pac. Car & Fdy.
Canada									
Canadian National	325	Automobile	.....	.....	.....	.....	February	.....	Can. Car & Fdy.
	175	Automobile	.....	.....	.....	.....	February	.....	Eastern Car
	25	Caboose	.....	.....	.....	.....	July	.....	Company Shops
Canadian Pacific	12	Ore	150,000	37 4	All Steel	74,000	May	October	Nat'l Steel Car
	100	Ore	150,000	28 6½	All Steel	.....	October	December	Can. Car & Fdy.
Canadian Salt Co.	5	Tank	.....	.....	.....	.....	February	.....	Am. Car & Fdy.
Export									
Andes Copper Mining Co.	66	Ore	80,000	.....	.....	.....	July	.....	Magor
Anglo Mexican Petroleum Co.	17	Tank	7,080g.	.....	.....	.....	August	.....	Middletown Car
Asiatic Petroleum Co.	1	Tank	.....	.....	.....	.....	March	.....	Am. Car & Fdy.
Atkins & Co., E. (Cuba)	150	Cane	60,000	37 6	St. Und'frame	30,800	May	October	Am. Car & Fdy.
	100	Cane	30,000	30 0	St. Und'frame	.....	June	November	Am. Car & Fdy.
	50	Cane	60,000	37 6	St. Und'frame	.....	August	December	Magor
Bliss Dallett & Co.	4	Gondola	.....	.....	.....	.....	April	.....	Am. Car & Fdy.
Caloric Company	10	Tank	.....	.....	.....	.....	March	.....	Middletown Car
Campion, P. J.	4	Dump	.....	.....	.....	.....	April	.....	Am. Car & Fdy.
	4	Dump	.....	.....	.....	.....	June	.....	Am. Car & Fdy.
Chateaugay Ore & Iron Co.	10	Ore	134,000	21 6	All Steel	57,000	October	.....	Am. Car & Fdy.
Chile Exploration Co.	16	Flat	.....	.....	.....	.....	April	.....	Magor
	15	Flat Bod.	.....	.....	.....	.....	April	.....	Magor
	2	Tank	10,000g.	.....	All Steel	.....	May	.....	General American
	100	Ore	140,000	.....	.....	.....	October	.....	Pressed Steel
Consolidated R. R.'s of Cuba	50	Box	80,000	.....	.....	.....	November	.....	Am. Car & Fdy.
	25	Stock	80,000	.....	.....	.....	November	.....	Am. Car & Fdy.
	200	Box	.....	.....	.....	.....	November	.....	Am. Car & Fdy.
	50	Stock	.....	.....	.....	.....	November	.....	Am. Car & Fdy.
Cuba Cane Sugar Corp.	15	Cane	60,000	37 6	Steel Frame	29,500	February	February	Magor
	50	Cane	60,000	37 6	All Steel	31,000	July	November	Am. Car & Fdy.
	50	Cane	60,000	37 6	Steel Frame	29,500	October	October	Standard Steel
Cuban Dominican Sugar Co.	217	Cane	60,000	.....	.....	.....	August	.....	Magor
Havana Central	250	Box	60,000	34 0	St. Und'frame	.....	October	.....	Am. Car & Fdy.
	145	Flat	60,000	35 6	St. Und'frame	.....	October	.....	Am. Car & Fdy.
International Rys. of Cen. America	8	Banana	8,000	.....	Steel Frame	.....	.....	.....	Gregg Co.
	80	Box	40,000	.....	Steel Frame	.....	.....	.....	Gregg Co.
	30	Cane	24,000	.....	Steel Frame	.....	.....	.....	Magor
	50	Dump	36 cu. yd.	.....	Steel Frame	.....	.....	.....	Koppel
	110	Flat	40,000	.....	Steel Frame	.....	.....	.....	Magor
	20	Stock	40,000	.....	Steel Frame	.....	.....	.....	Magor
	8	Tank	4,300g.	.....	Steel Frame	.....	.....	.....	Magor
Mitsui & Co.	52	Dump	5 cu. yd.	.....	.....	.....	December	.....	Case Crane & Eng.
N. Amer. Trad. & Imp. Co. (Cuba)	50	Tank	8,000g.	.....	.....	.....	.....	.....	Am. Car & Fdy.
South Porto Rico Sugar Co.	30	Cane	60,000	.....	.....	.....	May	.....	Magor
Victoria Railways (Australia)	2	Gondola	.....	.....	.....	.....	February	.....	Am. Car & Fdy.
	2	Flat	.....	.....	.....	.....	February	.....	Am. Car & Fdy.
	12	Hopper	80,000	.....	.....	.....	February	.....	Am. Car & Fdy.
	2	Louvre	.....	.....	.....	.....	February	.....	Am. Car & Fdy.
Warner Sugar Co.	75	Cane	.....	.....	.....	.....	August	.....	Magor
Wesselhoeft & Poor	3	Flat	.....	.....	.....	.....	August	.....	Magor
	3	Gondola	.....	.....	.....	.....	August	.....	Magor



Interiors of the Wabash's "Banner Blue Limited"



Passenger Car Built for the Lehigh Valley by the Pullman Car & Manufacturing Corporation.

Passenger Car Orders in 1925

Most satisfactory part of equipment market—Large purchases by N. Y. C. and P. R. R.

By F. W. Kraeger

ORDERS placed in 1925 for passenger train cars for service in the United States totaled 2,191. This compared with 2,554 in 1924; with 2,214 in 1923 and with 2,382 in 1922. The totals given do not include the increasingly popular rail motor cars, details concerning the orders for which are contained in a separate article.

Railways in Canada reported orders for only 50 passenger train cars, the smallest number since 1918.

Production of passenger train cars for domestic service

TABLE I—THE PASSENGER CAR ORDERS OF 1925

For service in the United States.....	2,191
For service in Canada.....	50
For export to other countries.....	76
Grand total.....	2,317

in the United States totaled 2,363 as compared with 2,150 in 1924. The 1924 production was the largest reported since 1914.

The passenger car orders in 1925 held up much better than did those of locomotives or freight cars. This apparently was partly due to catching up on requirements, delay in meeting which was occasioned by the war. However, the interesting feature is that whereas freight traffic was heavy and orders for both cars and locomotives were light, the opposite was true in the case of passenger traffic and orders for passenger cars. The passenger traffic in 1925 will probably be found, when the final figures for the year

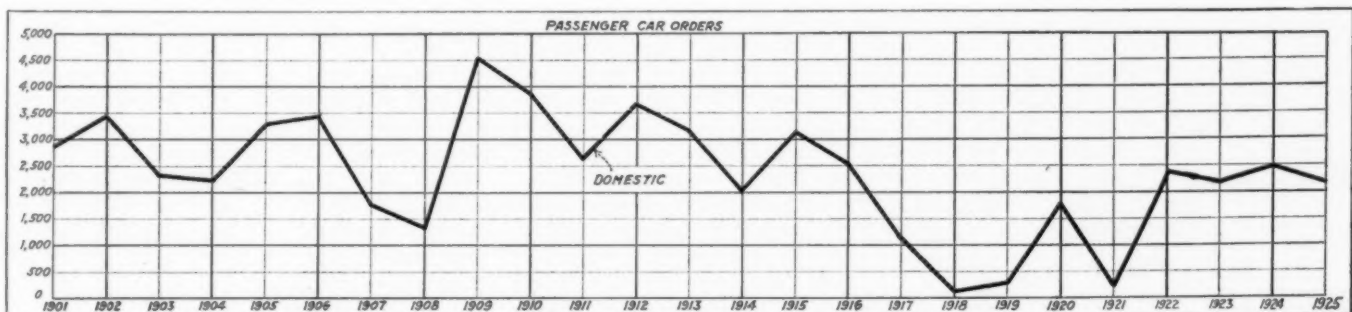
are available, to have been about one-quarter less than in 1920. The fact that with this decrease in business the orders should have been so large apparently is a reflection of the great effort the railroads are making to restore their passenger traffic. While it is true that the railways have

TABLE II—ORDERS FOR PASSENGER CARS SINCE 1901

Domestic Orders Only			
Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	5,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign				
Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317

had substantial losses in their passenger traffic, this loss has been in the short haul business. The railways have reported satisfactory long-haul passenger traffic, and it is believed in many quarters that not the least reason for



Passenger Car Orders, 1901 to 1925

this aspect of an otherwise unsatisfactory situation is the special attention given to the through schedules and trains. It has been many years since there have been so many reports of improved schedules, the re-equipping of

TABLE III—PASSENGER CARS BUILT IN 1925

	United States	Canada	Total
Domestic	2,365	.....	.....
Foreign	50	.....	.....
	2,413	.....	.....

Comparison with Previous Years

Year	Passenger		Total
	Domestic	Foreign	
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

*Includes Canadian output.

†Includes Canadian output and equipment built in company shops.

Year	United States			Canadian			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,503
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	...
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	...
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	...

"crack limiteds" with new cars, etc., as occurred in 1925.

In articles dealing with locomotive and freight car orders appearing elsewhere in this issue, attention has been drawn to the large proportion of the orders placed by the roads in the Southern and Southwestern regions.

This was not the case with the passenger train cars. The largest single order for passenger train equipment was placed by the Pennsylvania when in July it distributed orders for 357 cars of which, peculiarly or significantly enough, no less than 122 were baggage and express cars. The Pennsylvania's passenger car orders for the year totaled 375. Early in December the New York Central placed the year's second largest order with a total of 274 cars. The New York Central was in the market at various times during the year, and the total of passenger train car orders placed for all the roads in the New York Central System was no less than 418 cars. Thus, between them the New York Central and the Pennsylvania placed about one-half of all the passenger train cars ordered by railroads during the year. As large as the orders of the two roads were, in neither case did they exceed the total of the Pullman Company which, in 1925, ordered 568 cars for Pullman Company service.

In 1924 the feature of passenger train car buying was the manner in which it was evenly spread throughout the year. This was not the case in 1925. Due to the concentration of business in the New York Central and the Pennsylvania orders, half the year's business was placed in the two months of July and December. The market was almost completely idle in May, June, August and September.

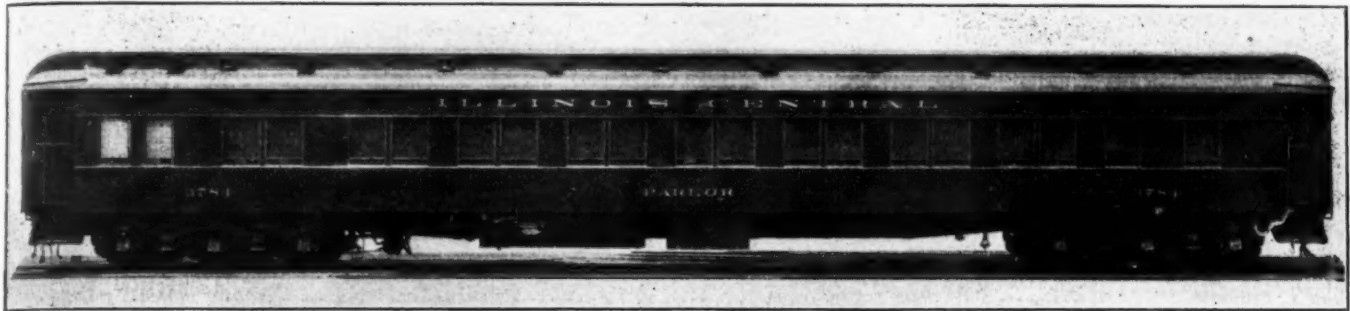
It is noteworthy that the statistics which follow show no orders for express refrigerator cars. The 1924 total included 250 such cars.

The lists of orders which follow are compiled in the usual manner, returns from the railroad being checked with and amplified from lists of orders furnished by the builders, largely through the co-operation of the American Railway Car Institute, and from the weekly reports of orders in the Equipment and Supplies column of the *Railway Age*. The lists appear in the same form as last year. The data for self-propelled rail motor cars are not included but are this year given in a separate article in which this comparatively still new and continually interesting phase of transportation is treated at some length.

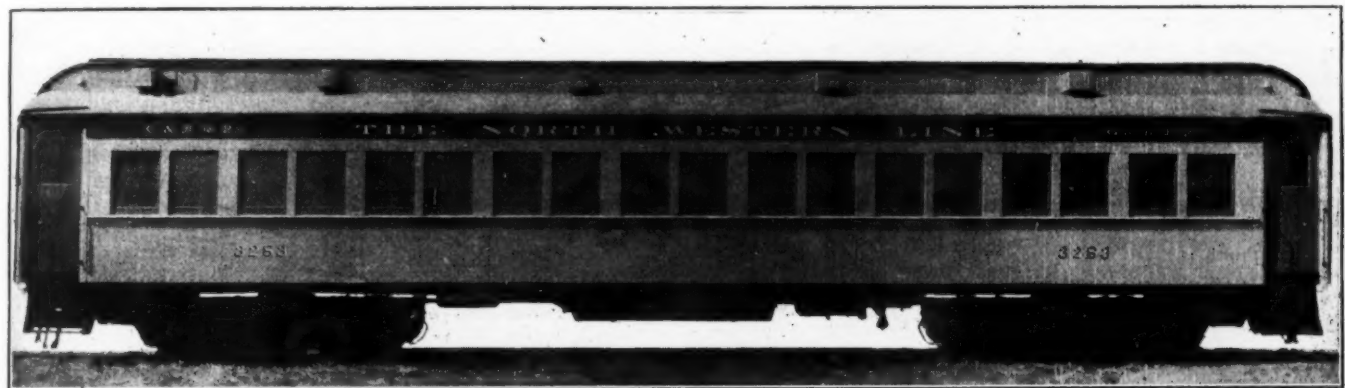
Passenger Car Orders in 1925

For Service in the United States

Purchaser	No.	Class	Length	Construction	Seating capacity	Weight	Wheels per truck	Builder
Alabama Great Southern.....	2	Horse	72 ft. 0½ in.	All Steel	...	140,800	6	Bethlehem Ship
Atchafson, Topeka & Santa Fe.....	4	Business	59 ft. 8½ in.	Steel Frame	...	140,700	6	Pullman
	2	Business	81 ft. 11 in.	Steel Frame	...	176,700	6	Pullman
Atl. & West Pt.—W. Ry. of Ala.....	2	Baggage	60 ft. 0 in.	St. Und'frame	...	120,000	6	W. of Ala. Shops
Atlantic Coast Line	30	Express	.....	.....	.....	.....	..	Pullman
	25	Coaches	.....	.....	.....	.....	..	Pullman
	10	Pass. & Bagg.	.....	.....	.....	.....	..	Pullman
	5	Mail & Bagg.	.....	.....	.....	.....	..	Pullman
	2	Mail	.....	.....	.....	.....	..	Pullman
Baltimore & Ohio	5	Dining	79 ft. 1½ in.	All Steel	36	169,000	6	Pullman
	10	M. U. Coaches	67 ft. 3½ in.	All Steel	71	95,750	4	Standard Steel
	10	Coaches	67 ft. 3½ in.	All Steel	71	90,000	4	Standard Steel
Bangor & Aroostook	1	Mail & Bagg.	68 ft. 11 in.	St. Und'frame	...	106,000	4	Company Shops
Boston & Albany	20	Coaches	77 ft. 0 in.	All Steel	100	102,000	4	Osgood-Bradley
Central Islip State Hosp.....	1	Hospital	54 ft. 0 in.	All Steel	...	.....	4	Am. Car & Fdy.
Central Vermont	20	Milk	.....	St. Und'frame	...	.....	..	Company Shops
Chesapeake & Ohio	10	Pass. & Bagg.	75 ft. 0 in.	All Steel	39	141,000	6	Bethlehem Ship
	3	Postal	63 ft. 0 in.	All Steel	...	130,000	6	Bethlehem Ship
Chic. & Rock Island & Pacific.....	5	Mail & Bagg.	70 ft. 0 in.	All Steel	...	132,500	6	Standard Steel
	2	Club	75 ft. 0 in.	All Steel	...	.....	8	Pullman
Cinn., New Orleans & Tex. Pac.....	4	Horse	72 ft. 0½ in.	All Steel	...	140,800	6	Bethlehem Ship
Clev., Cinn., Chic. & St. Louis.....	25	Baggage	61 ft. 3 in.	All Steel	...	112,000	4	Am. Car & Fdy.
	10	Dining	73 ft. 6 in.	All Steel	36	171,000	6	Pullman
	3	Pass. & Bagg.	70 ft. 0 in.	All Steel	48	127,400	4	Pressed Steel
	20	Coaches	.....	.....	.....	.....	..	Pullman
	2	Dining	.....	.....	.....	.....	..	Pullman



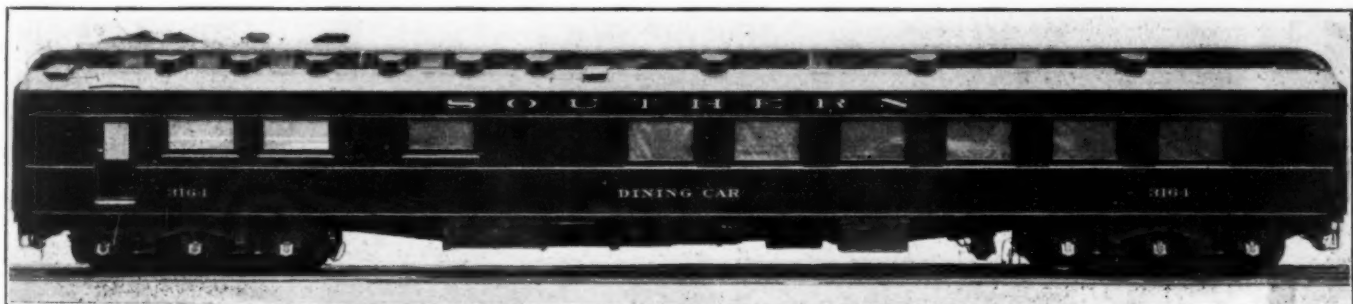
Built by the Pullman Car & Manufacturing Company for the Illinois Central



Built for the Chicago & North Western by the American Car & Foundry Company



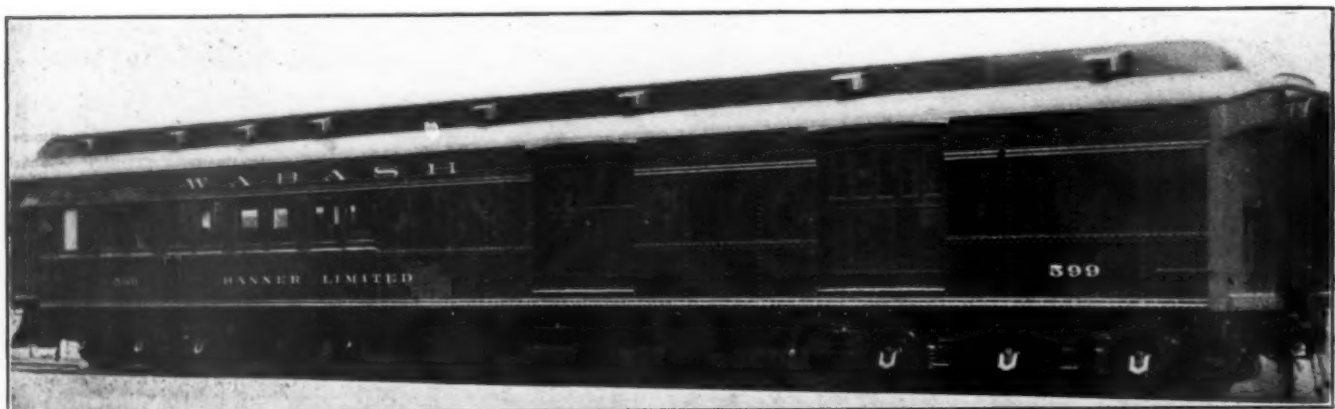
Built for the Louisville & Nashville by the Pressed Steel Car Company



Built for the Southern by the Pullman Car & Manufacturing Company

A Few of the Passenger Cars Built During 1925

Purchaser	No.	Class	Length	Construction	Seating capacity	Weight	Wheels per truck	Builder
Delaware, Lackawanna & Western...	40	Milk	45 ft. 5¼ in.	St. Und'frame	...	69,700	4	Osgood-Bradley
	15	Coaches	75 ft. 1½ in.	All Steel	80	121,000	4	Pullman
	2	Mail & Bagg.	74 ft. 1 in.	All Steel	...	131,300	4	Am. Car & Fdy.
	35	Express	60 ft. 0 in.	.....	.....	.....	..	Am. Car & Fdy.
Erie	24	Coaches	77 ft. 9¾ in.	All Steel	84	141,000	6	Standard Steel
	100	Coaches	73 ft. 7¼ in.	All Steel	86	94,200	4	Standard Steel
Florida East Coast	15	Coaches	70 ft. 0 in.	All Steel	76	142,300	6	Pullman
	3	Dining	73 ft. 6 in.	All Steel	36	155,700	6	Pullman
	15	Baggage	70 ft. 0 in.	All Steel	...	133,400	6	Pullman
Georgia	2	Pass. & Bagg.	76 ft. 0 in.	St. Und'frame	50	141,420	6	Company Shops
Georgia, Florida & Alabama.....	2	Bagg. & Exp.	.....	.....	...	.....	..	Bethlehem Ship
	3	Mail & Exp.	.....	.....	...	.....	..	Bethlehem Ship
	3	Coaches	.....	.....	...	.....	..	Bethlehem Ship
Great Northern	2	Dining	83 ft. 9¾ in.	Steel Frame	36	181,200	6	Pullman
Gulf Coast Lines.....	2	Baggage	.....	All Steel	...	.....	6	Am. Car & Fdy.
International-Great Northern	4	Baggage	70 ft. 0 in.	All Steel	...	.....	6	Am. Car & Fdy.
Kenny, W. F.	1	Private	80 ft. 0 in.	All Steel	...	186,000	6	Pullman
Kentucky Game & Fish Comm.....	1	Game & Fish	.....	.....	...	.....	..	Am. Car & Fdy.
Lehigh & New England.....	1	Business	74 ft. 0½ in.	All Steel	...	156,960	6	Am. Car & Fdy.
Long Island	20	Coaches	63 ft. 4¾ in.	All Steel	76	78,100	4	Am. Car & Fdy.
Louisville & Nashville	4	Bagg. & Horse	74 ft. 1¾ in.	All Steel	...	136,400	6	Am. Car & Fdy.
	2	Postal	62 ft. 10¾ in.	All Steel	...	131,600	6	Am. Car & Fdy.
	4	Smoking Compt.	77 ft. 9¾ in.	All Steel	80	145,500	6	Am. Car & Fdy.
	4	Smoking Compt.	77 ft. 9¾ in.	All Steel	80	145,700	6	Am. Car & Fdy.
	4	Coaches	68 ft. 11¾ in.	All Steel	76	116,400	4	Am. Car & Fdy.
	4	Smoking Compt.	68 ft. 11¾ in.	All Steel	72	116,400	4	Am. Car & Fdy.
	2	Pass. & Bagg.	73 ft. 10½ in.	All Steel	36	140,100	6	Am. Car & Fdy.
	10	Baggage	74 ft. 1¾ in.	All Steel	...	135,500	6	Pressed Steel
	2	Mail & Bagg.	74 ft. 1¾ in.	All Steel	...	140,000	6	Pressed Steel
	2	Mail & Bagg.	74 ft. 1¾ in.	All Steel	...	140,000	6	Pressed Steel
Michigan Central	2	Dining	80 ft. 10 in.	All Steel	36	168,000	6	Pullman
	2	Bagg. & Mail	64 ft. 1 in.	All Steel	...	119,000	4	Am. Car & Fdy.
	5	Baggage	72 ft. 10 in.	All Steel	...	136,700	6	Am. Car & Fdy.
	3	Baggage	72 ft. 10 in.	St. Und'frame	...	114,600	6	Company Shops
	15	Baggage	.....	.....	...	.....	..	Am. Car & Fdy.
	2	Pass. & Bagg.	70 ft. 0 in.	All Steel	48	127,400	4	Pressed Steel
	15	Coaches	.....	.....	...	.....	..	Pullman
	3	Dining	.....	.....	...	.....	..	Pullman
Minn., St. Paul & S. S. Marie.....	10	Exp. Refr.	41 ft. 5¼ in.	St. Und'frame	...	75,400	4	Company Shops
Missouri Pacific	10	Baggage	70 ft. 0 in.	All Steel	...	129,000	6	Am. Car & Fdy.
	10	Mail Storage	70 ft. 0 in.	All Steel	...	129,000	6	Am. Car & Fdy.
	1	Pass. & Mail	70 ft. 0 in.	All Steel	44	145,000	6	Am. Car & Fdy.
	6	Coaches	79 ft. 0 in.	All Steel	84	142,300	6	Pullman
	9	Mail & Bagg.	73 ft. 0 in.	All Steel	...	124,800	6	Pullman
	2	Dining	82 ft. 0 in.	All Steel	36	158,250	6	Am. Car & Fdy.
	1	Business	84 ft. 0 in.	All Steel	...	181,000	6	Am. Car & Fdy.
	1	Business	84 ft. 0 in.	All Steel	...	181,000	6	Pullman
	15	Baggage	70 ft. 0 in.	All Steel	...	129,000	6	Am. Car & Fdy.
	5	Dining	82 ft. 0 in.	All Steel	36	158,250	6	Pullman
Nashville, Chatt., & St. Louis.....	2	Baggage	70 ft. 0 in.	All Steel	...	128,300	6	Am. Car & Fdy.
	2	Dining	80 ft. 1½ in.	All Steel	36	168,000	6	Pullman
New York Central	29	M. U. Coaches	68 ft. 4½ in.	All Steel	82	130,700	4	Standard Steel
	10	Dining	81 ft. 3¾ in.	All Steel	36	170,000	6	Pullman
	10	Coaches	77 ft. 9¾ in.	All Steel	85	132,200	4	Pressed Steel
	15	Baggage	63 ft. 3¾ in.	All Steel	...	111,000	4	Standard Steel
	8	Bagg. & Mail	63 ft. 3¾ in.	All Steel	...	118,800	4	Am. Car & Fdy.
	40	Coaches	.....	.....	...	.....	..	Am. Car & Fdy.
	35	Coaches	70 ft. 0 in.	All Steel	84	130,400	4	Pressed Steel
	4	Pass. & Bagg.	70 ft. 0 in.	All Steel	48	127,400	4	Pressed Steel
	15	Dining	.....	.....	...	.....	..	Pullman
	25	Coaches	.....	.....	...	.....	..	Osgood-Bradley
	32	Bagg. & Mail	.....	.....	...	.....	..	Standard Steel
	20	Milk	.....	.....	...	.....	..	Merchants Dispatch
	18	Baggage	.....	.....	...	.....	..	Company Shops
N. Y., N. H. & Hartford.....	13	M. U. Motor	79 ft. 7¼ in.	All Steel	121	175,500	4	Osgood-Bradley
	22	M. U. Trailer	79 ft. 7¼ in.	All Steel	121	104,000	4	Osgood-Bradley
	6	Dining	82 ft. 4 in.	All Steel	42	158,000	6	Pullman



Passenger and Baggage Car Built by American Car & Foundry Company

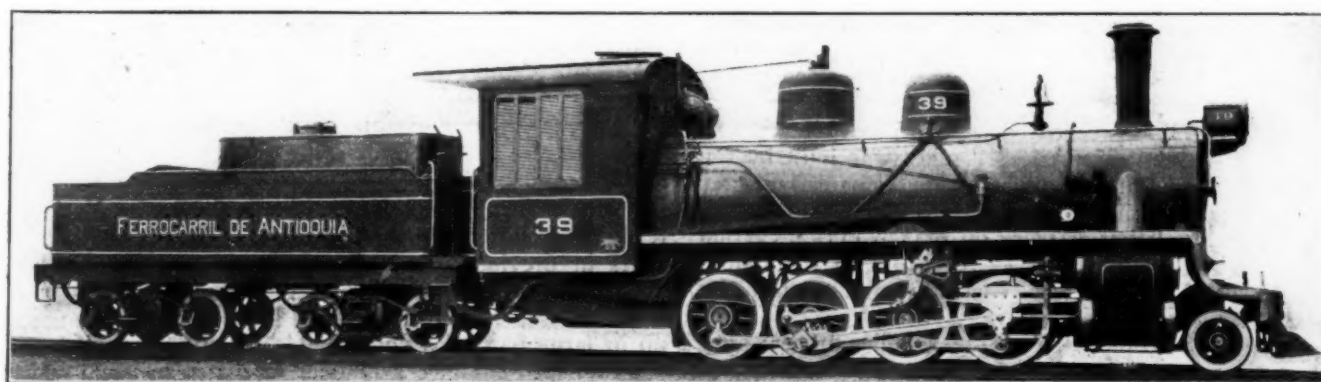
Purchaser	No.	Class	Length	Construction	Seating capacity	Weight	Wheels per truck	Builder
Norfolk & Western	13	Coaches	70 ft. 0 in.	All Steel	72	110,000	4	Bethlehem Ship
	5	Coaches	70 ft. 0 in.	All Steel	70	110,000	4	Bethlehem Ship
	6	Pass. & Bagg.	70 ft. 0 in.	All Steel	44	100,000	4	Bethlehem Ship
	4	Mail & Bagg.	62 ft. 6 3/4 in.	All Steel	...	98,000	4	Bethlehem Ship
	15	Bagg. & Exp.	62 ft. 6 3/4 in.	All Steel	...	98,000	4	Bethlehem Ship
Northern Pacific	10	Observation	83 ft. 2 3/4 in.	All Steel	35	169,000	6	Pullman
Pennsylvania	8	M. U. Coaches	54 ft. 0 in.	All Steel	72	116,600	4	Company Shops
	10	Dining	78 ft. 0 in.	All Steel	36	154,000	6	Company Shops
	15	Pass. & Bagg.	70 ft. 0 in.	All Steel	44	129,000	6	Am. Car & Fdy.
	122	Bagg. & Exp.	60 ft. 0 in.	All Steel	...	96,000	4	Am. Car & Fdy.
	10	Mail & Bagg.	70 ft. 0 in.	All Steel	...	129,000	6	Pressed Steel
	80	Bagg. & Exp.	60 ft. 0 in.	All Steel	...	96,000	4	Pressed Steel
	70	Coaches	70 ft. 0 in.	All Steel	88	122,000	4	Standard Steel
	35	Coaches	70 ft. 0 in.	All Steel	88	122,000	4	Pullman
	5	Pass. Bagg. & Mail	70 ft. 0 in.	All Steel	36	134,000	6	Pullman
	20	Bagg. & Exp.	60 ft. 0 in.	All Steel	...	96,000	4	St. Louis Car
Pittsburgh & Lake Erie	3	Baggage	69 ft. 3 in.	All Steel	...	137,000	6	Am. Car & Fdy.
	2	Pass. & Bagg.	70 ft. 0 in.	All Steel	48	128,000	4	Pressed Steel
	10	Baggage	...	...	...	...	...	Am. Car & Fdy.
	15	Coaches	70 ft. 0 in.	All Steel	84	130,400	4	Pressed Steel
Pullman Company	502	Gen'l. Ser. Sleeping	...	...	...	...	...	Pullman
	47	Bagg. & Library	...	...	...	...	...	Pullman
	5	Par. & Obs.	...	...	...	...	...	Pullman
	14	Dining	...	...	...	...	...	Pullman
Reading Company	5	Mail & Bagg.	63 ft. 0 in.	All Steel	...	114,420	4	Bethlehem Ship
	5	Mail & Bagg.	63 ft. 0 in.	All Steel	...	114,820	4	Am. Car & Fdy.
	15	Baggage	63 ft. 0 in.	...	...	...	...	Am. Car & Fdy.
Richmond, Fredericksburg & Potomac	6	Postal	83 ft. 7 in.	All Steel	88	140,900	6	Bethlehem Ship
	4	Express	74 ft. 9 3/4 in.	All Steel	...	133,000	6	Bethlehem Ship
	1	Coaches	74 ft. 0 in.	All Steel	...	140,000	6	Bethlehem Ship
St. Louis-San Francisco	10	Baggage	70 ft. 0 in.	All Steel	...	...	6	Am. Car & Fdy.
	14	Coaches	...	...	...	...	...	Am. Car & Fdy.
Seaboard Air Line	12	Dining	79 ft. 5 in.	All Steel	36	156,500	6	Pullman
	4	Bagg. & Mail	...	...	...	...	...	Am. Car & Fdy.
Southern	4	Dining	80 ft. 1 in.	All Steel	36	156,500	6	Pullman
	4	Horse	73 ft. 0 1/2 in.	All Steel	...	140,800	6	Bethlehem Ship
Southern Pacific	6	Bagg.-Horse	70 ft. 0 in.	All Steel	...	...	...	Am. Car & Fdy.
	10	Coaches	72 ft. 0 in.	All Steel	...	...	...	Pullman
	6	Bagg. & Mail	70 ft. 0 in.	All Steel	...	...	...	Standard Steel
	5	Baggage	70 ft. 0 in.	All Steel	...	...	...	Bethlehem Ship
	1	Dynamometer	56 ft. 6 in.	All Steel	...	...	...	Standard Steel
	5	Pass. & Bagg.	72 ft. 6 in.	All Steel	...	...	...	Am. Car & Fdy.
	2	Business	...	All Steel	...	...	...	Pullman
Thompson, W. B.	1	Private	80 ft. 0 in.	All Steel	...	189,000	6	Pullman
Union Pacific	5	Dining	83 ft. 0 in.	All Steel	36	160,000	6	Pullman
	15	Baggage	69 ft. 0 in.	All Steel	...	118,000	6	Am. Car & Fdy.
	15	Coaches	70 ft. 0 in.	All Steel	81	140,000	6	Pullman
	5	Observation	83 ft. 0 in.	All Steel	35	144,500	6	Pullman
	1	Business	83 ft. 1 1/2 in.	All Steel	...	...	6	Pullman
Wabash	20	Baggage	73 ft. 6 1/2 in.	All Steel	...	124,000	6	Am. Car & Fdy.

CANADA

Canadian National	11	Tour. Sleeping	73 ft. 6 in.	All Steel	...	165,000	6	National Steel
Canadian Pacific	15	Baggage	45 ft. 0 in.	All Steel	...	79,200	4	Can. Car & Fdy.
	15	Baggage	45 ft. 0 in.	All Steel	...	80,500	4	National Steel
Temiskaming & Nor. Ontario	6	Coaches	79 ft. 10 1/2 in.	All Steel	80	146,000	6	National Steel
	3	Baggage	74 ft. 9 1/2 in.	All Steel	...	125,000	6	National Steel

EXPORT

Consolidated Railroads of Cuba	5	1st C. Coaches	...	...	...	...	...	Am. Car & Fdy.
	8	2nd C. Coaches	...	...	...	...	...	Am. Car & Fdy.
Havana Central	7	1st Cl. Coaches	71 ft. 4 in.	Wood Frame	78	...	...	Am. Car & Fdy.
	12	2nd Cl. Coaches	71 ft. 4 in.	Wood Frame	62	...	...	Am. Car & Fdy.
	8	Motor	...	...	60	50,000	...	Wason Mfg. Co.
International Rys. of Cen. America	28	Coaches	50 ft. 0 in.	Steel Frame	60	...	...	Am. Car & Fdy.
	6	Obs. Chair	49 ft. 6 in.	Steel Frame	...	...	...	Wason Mfg. Co.
Newfoundland Government Rys.	2	Sleeping	...	...	...	...	...	Am. Car & Fdy.



3-Ft. Gauge Locomotive Built for Service in Columbia by the American Locomotive Company



The Chicago Union Station Which Was Placed in Service Last Year

Construction Activities in 1925 Show Increase

Marked increase in new first and second track—Several large projects carried over

By N. D. Howard

IN point of new main track mileage completed during the year, 1925 presents a record in railroad construction that has not been equalled for a number of years. Thus the aggregate length of first track (new lines) constructed was 644 miles, a larger total than for any previous year since 1919 when it was 686 miles, while the second track mileage completed was 689, a total that has not been equalled since 1913 when it amounted to 1,264 miles. It is true, as will be seen in the chart for multiple track construction, that in two years, namely, 1918 and 1923, the second track construction mileage approached closely to that of the year just closed, but this was not the case in any other year since 1913. As regards both first and second track the figures for 1925 are well above those for the preceding year.

In Canada construction showed a decrease as compared with the two previous years, the total new line mileage being 414 in 1925, as compared with 615 in 1924 and 655 in 1923. Of the 1925 total, 312 miles was built by the Canadian National and 75 miles by the Canadian Pacific, the greater part of the added mileage on both roads representing the completion of work on branch lines. Second track work in Canada during 1925, as in most years since the outbreak of the war, was practically nil, amounting to only 3.67 miles.

In Mexico the completion of 132.38 miles of new lines during the past year marked the renewal of activities in that country with the restoration of more stable political

and economic conditions. The total given above embraces 69 miles comprising the completed portion of the extension which the Southern Pacific of Mexico is building from Tepic to LaQuemada, 37.5 miles laid by the Western Railway of Mexico from Culiacan to Altata, 16 miles of new line by the Mexicali-San Felipe in the state of

MILES OF NEW LINE COMPLETED IN THE UNITED STATES SINCE 1893

1893.....	3,024	1909.....	3,748
1894.....	1,760	1910.....	4,122
1895.....	1,420	1911.....	3,066
1896.....	1,692	1912.....	2,997
1897.....	2,109	1913.....	3,071
1898.....	3,265	1914.....	1,532
1899.....	4,569	1915.....	933
1900.....	4,894	1916.....	1,098
1901.....	5,368	1917.....	979
1902.....	6,026	1918.....	721
1903.....	5,652	1919.....	686
1904.....	3,832	1920.....	314
1905.....	4,388	1921.....	475
1906.....	5,623	1922.....	324
1907.....	5,212	1923.....	427
1908.....	3,214	1924.....	579
		1925.....	644

Lower California, and 9.88 miles laid by the National Railways of Mexico in Durango.

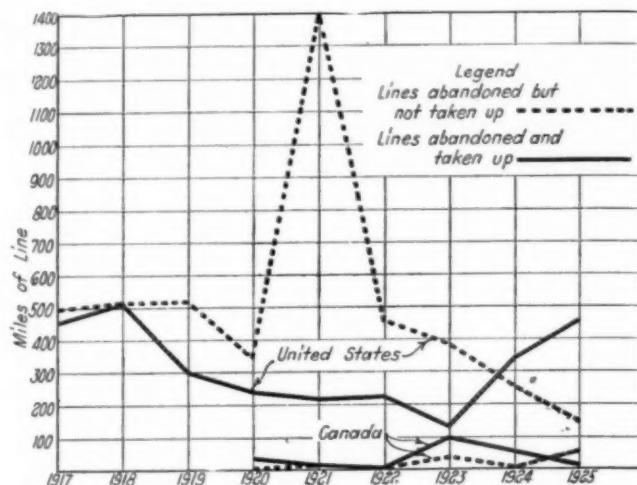
As in previous years the total mileages of new line and additional main track presented under the classification by states, which appears in these columns, are made up in large part of a considerable volume of small items but they also embrace a number of major projects which may be singled out as indicating general trends of railway

taken primarily for the purpose of effecting immediate operating economies. However, it also includes a number of important projects designed to increase capacity. Under this heading are included terminal improvements, including new terminals and additions to existing yards, the construction and enlargement of enginehouses and power plants, new passenger and freight stations, water service and coal handling facilities. The most outstanding project placed in service during the year is the Chicago Union Station, representing an aggregate expenditure in excess of \$70,000,000. Another large improvement now nearly completed is the Markham yard of the Illinois Central at Harvey, Ill., a suburb of Chicago, entailing an investment of \$10,500,000.

Bridge work, while large in the aggregate, did not include many projects of first magnitude. The largest on which work was carried on during the past year and which is now nearing completion is the four-track Newark Bay bridge of the Central Railroad of New Jersey, which is 7,400 ft. long and in many ways an unusual structure. The St. Johns River bridge of the Florida East Coast at Jacksonville was completed during the year and work was started on the substructure of the new bridge across the Mississippi for the Santa Fe at Ft. Madison, Iowa.

Grade separation and line revision again absorbed the attention of many railroads throughout the country, large sums having been expended in the completion of work of this character carried over from 1924 and in undertaking new projects, many of which will extend into 1926. While the great majority of these projects are local, involving

the elimination of one or more grade crossings, there are several of large magnitude, including that carried on by the Illinois Central in connection with its extensive terminal improvement work in the Chicago terminal area.



Miles of Line Abandoned in the United States and Canada

Other large grade separation projects prosecuted by this road are those at Champaign, Ill., and Jackson, Miss.

Material progress is being made on the six-mile Moffat tunnel which is being constructed through the Continental

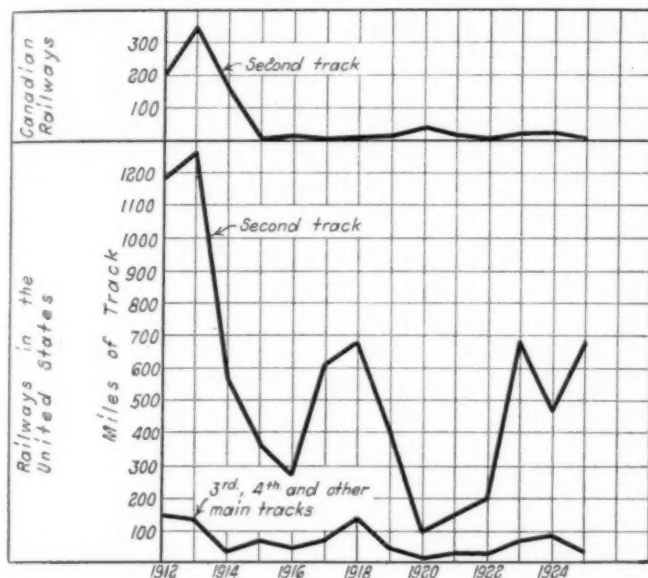
Lines Abandoned in the United States and Canada

United States	Lines Abandoned and Taken Up Miles	Lines Abandoned but Not Taken Up Miles	United States	Lines Abandoned and Taken Up Miles	Lines Abandoned but Not Taken Up Miles
Alexander & Eastern—			Manistee & North Eastern—		
Alexander, W. Va., to Big Run.....	29.00	1.00	River Branch Jct., Mich., to Grayling.....	76.83	....
Andalusia Florida & Gulf—			Minneapolis & St. Louis—		
Galliver, Fla., to Falco, Ala.....	....	26.00	Van Cleve, Ia., to State Center.....	10.46	....
Atlantic City Railroad—			Mobile & Ohio—		
At Alco, N. J.....	.01	....	Delchamps, Ala., to Alabama Port.....	3.91	....
Ocean City Junction, N. J., to Sea Isle City.....	....	8.24	New York, New Haven & Hartford—		
Barre & Chelsea—			Pontiac, R. I., to Clyde.....	2.22	....
At Barre, Vt.....	0.36	....	South Deerfield, Mass., to Shelburne Jct.....	6.61	....
Boston & Maine—			Norfolk & Western—		
Nashua, N. J., to North Acton, Mass.....	18.12	....	On Beaver Dam Branch of Abingdon Branch....	0.23	....
At North Acton.....	....	0.14	Northern Pacific—		
At Nashua.....	....	1.85	Broadwater, Mont., to Rimini.....	12.83	....
Butte, Anaconda & Pacific—			Snokomish, Wash., to Everett.....	6.96	....
Brown, Mont., to Southern Cross.....	16.35	....	Clough Jct., Mont., to Marysville.....	12.57	....
Central Arizona—			Northwestern Pacific—		
In Arizona.....	3.00	5.00	Duncan Mills, Calif., to Markham.....	2.46	....
Central New England—			Oregon Short Line—		
Boston Corners, N. Y., to Ancram Lead Mines... ..	....	5.97	Hammett, Idaho, to Chalk.....	6.66	....
Millerton, N. Y., to Shekomoko.....	....	7.78	Pacific Electric—		
Chicago, Milwaukee & St. Paul—			In Los Angeles, Calif.....	0.54	....
Tomah, Wis., to Babcock.....	12.01	....	In Pasadena, Calif.....	0.44	....
Wausaukee, Wis., to Girard Junction.....	17.72	....	In Pomona, Calif.....	6.83	....
Chicago, Rock Island & Pacific—			In Riverside, Calif.....	3.26	....
Davenport, Ia., to Stockton.....	17.50	....	Pennsylvania & Atlantic—		
Winnfield, La., to Packton.....	9.42	....	Brown's Mills Jct., N. J., to Brown's Mills in the Pines.....	....	1.82
Colorado & Southern—			Pennsylvania—		
Beshoar Junction, Colo., to Grey Creek Mine....	7.85	....	E. Burlington N. J., to Mount Holly.....	7.12	....
Delaware & Hudson—			On Amesville Branch No. 3.....	0.20	....
Canada Jct., to Province Line.....	12.76	....	Mayville, N. Y., to Chautauqua.....	....	2.64
Delaware & Northern—			From extension of Greene County Coal Branch to abandoned mines at Dugger, Ind.....	0.93	....
Andes Jct., N. Y., to Andes.....	8.75	....	Peoria Railway Terminal—		
Denver & Rio Grande—			Line in Peoria, Ill.....	4.20	....
Larimer, Colo., to Lascar.....	7.80	....	Port Townsend & Puget Sound—		
Capers, Colo., to Graneros.....	5.53	....	Discovery Jct., Wash., to Quecene.....	....	14.10
Manti, Utah, to Ephraim.....	7.01	....	Rio Grande & Eagle Pass—		
Midas, Utah, to Cuprum.....	2.70	....	Minira, Texas, to Darwin Jct.....	1.51	....
Detroit, Bay City & Western—			San Francisco, Napa & Calistoga—	....	1.20
Port Huron, Mich., to Roseburg.....	23.00	....	Vallejo, Calif., to Wharf.....	....	1.20
East Texas & Gulf—			Virginian—		
Hickbough, Texas, to Wurtsbough.....	5.00	....	Westerly end of White Oak Branch at Carlisle, W. Va.....	0.27	....
Escanaba & Lake Superior—			Total.....	456.53	149.74
Logging Branches in Michigan.....	6.00	....	Canada		
Freeo Valley—			Canadian National—		
Eagle Mills Ark., to Princeton.....	25.00	....	At Port Colborne Ont.....	0.24	....
Great Northern—			Grant Trunk Pacific—		
Fermoy, Minn., to Olcott.....	21.14	....	In vicinity of Camrose.....	9.44	....
Kalamazoo Lake Shore & Chicago—			At Snarling Jct.....	.64	....
Kalamazoo, Mich., to Lawton.....	15.94	....	Maine Central—		
Laurel Fork—			Beecher Falls, Vt., to Lime Ridge, Que.....	....	53.06
Elizabethton, Tenn., to Frog Level.....	7.00	7.00	Total.....	10.32	53.06
Lorain, Ashland & Southern—					
Loraine Ohio, to Custolaga.....	....	67.00			
Louisiana & Pacific—					
DeRidder Jct., La., to Longacre.....	8.70	....		
Louisiana Southern—					
In New Orleans, La.....	1.82	....		

divide in Colorado with public funds, although intended primarily for railroad use. During the past 12 months the twin headings which are being driven from each portal have been advanced about three miles, leaving a gap of only about 9,000 feet between the faces of the east and west headings. Work on the enlargement of this tunnel to full section is now approximately 50 per cent complete.

New Construction in 1926

The data upon which the facts concerning construction completed during the past year were based show also that large additions in mileage will be made during the coming year. These comprise both uncompleted sections of work



Multiple Track Mileage Constructed in the United States and Canada

in progress during the past year, and new projects only recently authorized or projected. Under the first heading are included 60 miles representing the incompleted portions of the alternate route being built by the Southern Pacific in California and Oregon and the 145 miles of new line which that road is building in Arizona for the purpose of developing an alternate main line through Phoenix. It includes the uncompleted portion of the Rogerson Wells line of the Oregon Short Line, having a total length of 94 miles, and the Edgewood cut-off of the Illinois Central from Edgewood, Ill., to Fulton, Ky.,

totaling 166 miles. Of the lines projected, one of the most important from a strategic standpoint is the proposed line of the Southern Pacific from Klamath Falls, Ore., to Alturas, Cal., a distance of 97 miles, for the purpose of effecting a connection with the Nevada, California & Oregon so as to develop a new route from Portland, Ore., to Ogden, Utah, via the Natron cut-off, the Nevada, California & Oregon and the Overland route of the Central Pacific, which will be appreciably shorter and afford substantially better grades than via existing Southern Pacific routes.

Among grade separation projects upon which work is contemplated during 1926 is the elevation of seven miles of the belt railway in Indianapolis, Ind., by the Indianapolis Union Railway, for the purpose of eliminating 23 street grade crossings and four railroad crossings and which involves also a five-track bridge, a new classification yard and numerous other changes at a total estimated cost of \$13,000,000.

Mileage Abandoned

Railway lines abandoned during the past year totaled 606 miles in the United States and 63 miles in Canada, as compared with 693 miles and 52 miles, respectively, in 1924. The total of 606 miles in the United States in 1925 does not include 77 miles for which the Interstate Commerce Commission authorized abandonment but concerning which no information has been received indicating whether or not the property has as yet taken any definite action.

In the United States 456 miles of the total mileage actually abandoned has been taken up, while 150 miles has been abandoned but not taken up. In Canada 10.3 miles have been taken up while 53 miles remain in place, although abandoned.

An examination of the table of abandoned lines shows that the mileage in the United States is widely scattered and consists for the most part of relatively short pieces of line. Motor bus and motor truck competition has doubtless been responsible for a considerable part of the abandonment, notably in New England. Lumber roads in exhausted forest areas also comprise a considerable part of the total. The three longest stretches of line abandoned in the United States during the past year are the Manistee & North Eastern from River Branch Junction, Mich., to Grayling, 76.83 miles; the Lorain, Ashland & Southern, from Lorain, Ohio, to Custolga, 67 miles; and the Alexander & Eastern, from Alexander, W. Va., to Big Run, 29 miles. In Canada the only item of importance is the line of the Maine Central from Beecher Falls, Vt., to Lime Ridge, Que., 53.06 miles.

Railway Construction in the United States

Alabama & Vicksburg

Important Work Undertaken: Joint track elevation with Illinois Central and construction of subway at Monument St., Jackson, Miss., \$300,000 (80 per cent completed).

Alaska

Second Track: Baxter, Alaska, to Howard and Jessen Mine, 2.79 miles. **Important Work Undertaken:** Two truss spans and one girder span for bridge, M. P. 370.7, main line \$225,000 (completed). Five girder spans on bridge, M. P. 1, Healy River coal spur, \$175,000 (completed). Two truss spans on bridge, M. P. 227.2, \$180,000 (50 per cent completed). Eleven girder spans on six steel bridges, \$200,000 (75 per cent completed).

Alton & Southern

First Track: Granite City Ill., to Mitchell 4.12 miles.

Atchison, Topeka & Santa Fe

First Track: (Elkhart & Santa Fe) Kansas-Oklahoma state line to Felt, Okla., 58.8 miles. (Panhhandle & Santa Fe) Dowd, Tex., to Bledsoe, 64.6 miles. (Constructed under corporate name of South Plains & Santa Fe Ry. Co.) **Second Track:** San Bernardino Cal., to Colton 0.9 miles. **Important Work Undertaken:** Double track piers, bridge near Chillicothe,

Ill. (completed). Double track bridge over Mississippi river, near Ft. Madison Iowa (30 per cent completed). Double track 26-ft. arch near Matfield Green, Kan. (completed). Renewal of bridge near Arkansas City with girders on concrete piers (completed). Enlargement of existing yard facilities Chillicothe, Ill. (60 per cent completed). Auction house and receiving yards, Chicago (65 per cent completed). Passenger station and track changes, Enid, Okla. (completed). Mechanical coal chute, sand dryer and engineer supply and locker building, Argentine, Kan. (completed). Mechanical coaling facilities, Shopton, Iowa (completed). Sewer system in shop yards, Argentine, Kan. (completed). Power house, office, welfare building, head house at elevator and additional yard tracks, Argentine, Kan. (85 per cent completed). Five 105-ft. girder spans and bank protection on Plains division (completed). Additional yard and terminal facilities, Hutchinson, Kan. (completed). Extension of Harvey House, Clovis, N. M. (5 per cent completed). Renewal of two bridges on Los Angeles division (completed). Viaduct at 9th and Macey Sts., Los Angeles, Cal. (completed). Depot and yard changes, Flagstaff, Ariz. (completed). Icing plant, Winslow, Ariz. (completed). Power house, Grand Canyon, Ariz. (75 per cent completed). Additional shop facilities, San Bernardino, Cal. (completed).

Atlanta & West Point and Western Railway of Alabama

Important Work Undertaken: New yard, Montgomery, Ala., \$235,000 (10 per cent completed).

Atlantic Coast Line

Second Track: Java, S. C., to Lanes, 41.06 miles. Drayton Hall, S. C., to Yemassee, 49.21 miles. Altamaha, Ga., to Burroughs, 37.8 miles. Albany, Ga., to Darrow, 2 miles. Moncrief, Fla., to Yukon, 10 miles. Orange City, Fla., to Sanford, 13 miles.

Important Work Undertaken: Line from Immokalee, Fla., to Deep Lake, 29 miles. Additional shops and yards, Ucita, Fla. (completed). Additional yard, Lakeland, Fla. (completed). Extension of shops, Milan Yard, N. C. (completed).

(Tampa Southern) Line from Sarasota, Fla., to Fort Ogden, 20 miles. (Fort Myers Southern) Line from Bonita Springs, Fla., to Merco, 23 miles.

Baltimore & Ohio

Second Track: Princess Bay, S. I., to Pleasant Plains, 0.82 miles.

Important Work Undertaken: Line, South Parkersburg, W. Va., 1.6 miles. Electrification of Staten Island lines, including installation of third rail power transmission lines and substations, \$2,185,000 (completed). Track elevation, eliminating six highway grade crossings and 0.82 miles of second track, between Princess Bay, S. I., and Pleasant Plains, 0.82 miles (85 per cent completed). Industrial spur, Richmond Valley, S. I., 1 mile, \$158,000 (completed). Track relocation and elevation through South Philadelphia, Pa., initial appropriation \$1,000,000 (40 per cent completed). Grade separation, including new highway bridge and approaches, Stepney, Md., \$123,000 (completed). Grade separation, including new subway and highway approaches, Silver Springs, Md., \$170,000 (completed). Grade separation, including new subway and approaches, Cumberland, Md., \$270,000 (completed). Reconstruction of bridge over Cheat river, Point Marion, Pa., \$250,000 (completed). Wooden trestle replaced with masonry arches and roadbed filled, Snowden, Pa., \$145,000 (completed). Track changes to improve alignment, Snowden, Pa., \$107,000 (completed). Relocation of line and double tracking between Warwick, Ohio, and Sterling, 7 miles, \$526,000 (30 per cent completed). Strengthening and extending bridge over Big Walnut creek, Big Walnut, Ohio, \$300,000 (35 per cent completed). Industrial track, Parkersburg, W. Va., 1.5 miles, \$100,000 (10 per cent completed). Reconstruction of bridges over Hocking river, Stewart, Ohio, \$285,000 (completed). Reconstruction of bridge over Hocking river, Guysville, Ohio, \$240,000 (completed). Reconstruction of bridge over Point creek, Musselman, Ohio, \$117,000 (completed). Reconstruction of bridges, Cincinnati, Ohio, \$170,000 (completed). Grade separation and subway at Ninth St., East St. Louis, Ill., \$218,000 (completed).

Bangor & Aroostook

Important Work Undertaken: Pier, Searsport, Me., \$370,000 (95 per cent completed).

Beaver Meade and Englewood

Important Work Undertaken: Extension from Turpin, Okla., to Hooker, 20 miles.

Bessemer & Lake Erie

Important Work Undertaken: Widening channel between Docks No. 1 and 4, and constructing dock front on Dock No. 1, Conneaut Harbor, Ohio, \$216,600 (90 per cent completed). Change of line, Coolspring, Pa., \$360,000 (72 per cent completed). Building anchorages for dock front and rear runways on Dock No. 1, Conneaut Harbor, Ohio, \$205,000 (80 per cent completed). Enlarging yard and installing electro-mechanical interlocking plant, Branchton, Pa., \$122,500 (50 per cent completed).

Boston & Maine

First Track: (Barre & Chelsea) At Barre, Vt., 0.47 miles. *Important Work Undertaken:* Eight-story reinforced concrete office building, East Cambridge, Mass., \$443,000 (70 per cent completed).

Calumet & Hecla Consolidated Copper Co.

First Track: Hubbell, Mich., to Ahmeek, 9.3 miles.

Canadian National

(U. S. A.)

Third Track: (Grand Trunk Western) At South Flint, Mich., 0.8 mile. *Important Work Undertaken:* (Grand Trunk Western) Grade separation, Dequindre line, Detroit, Mich. (35 per cent completed). Grade separation, West Detroit line, Detroit, Mich. (50 per cent completed). Grade separation, 24th St., Port Huron, Mich. (completed). Terminal improvements, Port Huron, Mich. (completed). Engine terminal, Nichols, Mich. (completed). (Central Vermont). Replacing bridge near North Duxbury, Vt. (completed). Replacing bridge, M. P. 122.16 Northern division, Georgia, Vt. (completed).

Central Arizona

First Track: In Arizona, 8 miles.

Central of Georgia

Important Work Undertaken: Revision of grades and change in alignment between Columbus, Ga., and Birmingham, Ala., \$7,000,000 (85 per cent completed). Viaduct, storage house and yard improvements, Columbus, Ga., \$636,000 (completed). Coach repair shop, Savannah, Ga., \$330,000 (completed).

Central Manufacturing District, Inc.

Important Work Undertaken: Additional yard tracks and switching leads, Los Angeles, Cal., 2.72 miles (completed).

Central of New Jersey

Important Work Undertaken: Bridge across Newark Bay, between Bayonne, N. J., and Elizabethport, \$9,456,716 (90 per cent completed). West approach to Newark Bay bridge, \$1,601,830 (60 per cent completed). East approach to Newark Bay, \$1,932,168 (20 per cent completed). Hudson County Boulevard, \$553,161 (20 per cent completed). Elimination of grade crossings, Perth Amboy, N. J., \$2,000,000 (30 per cent completed). Elimination of grade crossings, Somerville, N. J., \$1,262,896 (82 per cent completed). Passenger terminal, Raritan, N. J., \$619,580 (88 per cent completed). Bridge, Allentown, Pa., \$219,969 (20 per cent completed). Four tracking, Hound Brook Jct., N. J., to Somerville, \$169,669 (25 per cent completed). Engine terminal, Bethlehem, Pa., \$2,000,000 (5 per cent completed).

Charleston & Western Carolina

Important Work Undertaken: Reducing grades between Laurens, S. C., and Spartanburg, \$210,000 (completed). Renewal of three bridges between Laurens, S. C., and Spartanburg, \$135,000 (completed).

Chesapeake & Ohio

Second Track: Hampton, Ky., to Lockwood, 6.44 miles. Buffalo Tunnel, Ky., to Auxier, 7.55 miles. Gregg, Ohio, to G. B. Cabin, 1.75 miles.

Third Track: Ashland, Ky., to Russell, 3.51 miles. Russell, Ky., to Riverton, 4.05 miles.

Fourth Track: Pike Crossing, Ky., to West Ashland 3.66 miles.

Important Work Undertaken: Purchase of Camp Morrison from U. S. Government, and rehabilitation of buildings, Morrison, Va., \$147,000 (completed). Six warehouses, and tracks to serve them, Morrison, Va., \$103,600 (completed). Two storage tracks, Ashland, Ky., \$134,300 (completed). Renewal of superstructures of four bridges between Dayton, Ky., and Bellevue, \$108,700 (completed). Freight terminal, Clifton Forge, Va., \$3,630,000 (completed). Passing siding, Gauley, W. Va., \$215,000 (88 per cent completed). Boiler shop, Huntington, W. Va., \$575,970 (10 per cent completed). Second track from Harts, W. Va., to Big Creek, \$243,000 (25 per cent completed). Road improvements and third track from Ashland, Ky., to Russell, \$2,579,880 (completed). Improvements to engine terminal, including roundhouse, turntable, etc., Russell, Ky., \$1,209,913 (60 per cent completed). Second track from Apex, Ohio, to Robbins, \$273,100 (86 per cent completed). Second track from Limeville, Ky., to Sciotoville, Ohio, \$385,000 (20 per cent completed). Second track from Wheeler, Ohio, to Apex, \$784,000 (8 per cent completed).

Chicago & Alton

Important Work Undertaken: Grain elevator and tracks, Kansas City, Mo., \$450,000.

Chicago & North Western

First Track: Beaton, Mich., north to end of track, 7.76 miles. Gogebic, Mich., north to end of track, 3.6 miles.

Important Work Undertaken: Line north from Wakefield, Mich., to end of track, 4.2 miles. Reconstruction of ore dock, Escanaba, Mich., \$1,946,250 (completed). Subway, Ogden Ave., Chicago, \$291,960 (completed). Subway, Ashland Ave., Chicago, \$677,900 (80 per cent completed). Yard, Proviso, Ill., \$1,740,000 (2 per cent completed). Diversion and depression of Lake street and North avenue, in connection with the construction of yard, Proviso, Ill., \$736,670 (1 per cent completed). Bridge over Salt creek, Luther, Ill., \$239,000 (80 per cent completed). Logging spur, Wakefield, Mich., 4 miles, \$215,000 (90 per cent completed). Logging spur, Gogebic, Mich., 4 miles, \$137,000 (95 per cent completed).

Chicago & Western Indiana

Important Work Undertaken: Elevation of tracks, including separation of grades with Illinois Central, Chicago, \$4,675,000 (35 per cent completed). Enlargement of facilities at Dearborn station, Chicago, \$350,000 (completed). Construction of additional tracks at Clearing yard, Chicago, \$157,000 (completed).

Chicago, Burlington & Quincy

Second Track: Vermont, Ill., to Frederick, 18 miles.

Important Work Undertaken: Restoration of line between Casper, Wyo., and Kirby, \$1,028,257 (completed). Industrial tracks, Peoria, Ill., \$100,000 (completed). Industrial tracks, Glenrock, Wyo., \$175,948 (completed). Ice house, Lincoln, Neb., \$125,000 (completed). Six 100-ft. deck plate girder spans on concrete piers, Woodcliff, Neb., \$151,736 (60 per cent completed). Single track bridge 240-ft. long, Chicago, \$175,305 (60 per cent completed). Elevating bridge and track, Harbo, Mo., \$101,227 (10 per cent completed). Improvement of terminal facilities, Denver, Colo., \$300,000 (completed). Passenger stations, five points, \$178,900 (90 per cent completed). Engine houses, six points, \$149,800 (95 per cent completed). Water treating plants, four points, \$85,300 (90 per cent completed). Storehouse, Aurora, Ill., \$535,700 (90 per cent completed). Additions to grain elevator, St. Joseph, Mo., \$213,900 (completed). Additions to grain elevator, Kansas City, Mo., \$446,700 (completed). Power plant, Galesburg, Ill., \$133,200 (completed). Viaduct over the tracks of Burlington, Rock Island and Santa Fe, 6th St., St. Joseph, Mo. (Burlington), \$44,000; total cost, \$132,000.

Chicago, Indianapolis & Louisville

Important Work Undertaken: Track elevation, Indianapolis, Ind., \$500,000 (completed).

Chicago, Milwaukee & St. Paul

Second Track: Through yard, St. Paul, Minn., 3.5 miles.

Third Track: Through yard, St. Paul, Minn., 3.5 miles.

Important Work Undertaken: New 24-stall enginehouse, powerhouse, machine shop, coal and water stations and other facilities, also 24 yard tracks, engine terminal, St. Paul, Minn., \$1,250,000 (95 per cent completed).

Chicago, Rock Island & Pacific

Second Track: Doubling Spur, Kan., to Latimer, 19.01 miles.

(Chicago, Rock Island & Gulf) Fort Worth, Tex., 1.47 miles.

Important Work Undertaken: Line under survey, Billings, Okla., to Ponca City, 29 miles. Reconstruction of bridge over White river, DeValls Bluff, Ark., \$514,000 (50 per cent completed). Elevation of tracks, South Chicago line, \$1,200,000 (15 per cent completed). Coach shop, Shawnee, Okla., \$275,000 (completed). Grain elevator, Council Bluffs, Ia., \$220,000 (completed).

Chicago Union Station Company

First Track: In Chicago, 1.42 miles.

Second Track: In Chicago, 1.2 miles.

Third Track: In Chicago, 1.27 miles.

Fourth Track: In Chicago, 1.08 miles.

Important Work Undertaken: Union station, including work on the head-house and concourse buildings, train sheds, tracks and platforms, Chicago, \$70,000,000 (98 per cent completed).

Clinchfield

Important Work Undertaken: Coach, carpenter and paint shop, including necessary tracks, Erwin, Tenn., \$148,000 (completed). Steel freight car shops, with necessary tracks and equipment, Erwin, Tenn., \$215,900 (completed).

Cowlitz, Chehalis & Cascade

First Track: In Washington, 6 miles.

Important Work Undertaken: Line from Salkum, Wash., to Cowlitz, 8 miles. Line projected from Cowlitz, Wash., to Randle, 26 miles.

Davenport, Rock Island & Northwestern

Important Work Undertaken: Passenger Station, office building, passenger tracks and coach spurs at Davenport, Ia., \$169,078 (completed).

Delaware, Lackawanna & Western

First Track: Kingsland, N. J., to Harrison, 4.9 miles.

Third Track: Lyndhurst, N. J., to Patterson Jct., 4.8 miles.

Fourth Track: Lyndhurst, N. J., to Patterson Jct., 4.8 miles.

Important Work Undertaken: Third and fourth track, including the elimination of one grade crossing and the reconstruction of three large bridges from Lyndhurst, N. J., to Paterson Jct., \$1,180,000 (completed). Changes in passenger terminal yard to provide additional yard and train shed facilities, Hoboken, N. J., \$950,000 (95 per cent completed). Single track line from Harrison, N. J., to Kingsland, \$2,175,000 (75 per cent com-

pleted). Team delivery yard, including freight house, Passaic, N. J., \$239,000 (65 per cent completed). Bascule branch over new channel of Buffalo river, Buffalo, N. Y., \$300,000 (80 per cent completed). Car repair shed, East Buffalo, N. Y., \$190,000 (completed). Elimination of Clinton street grade crossing, Buffalo, N. Y., \$310,000 (90 per cent completed). Engine terminal and classification yard, East Binghamton, N. Y., \$1,500,000 (completed).

Denver & Rio Grande

Important Work Undertaken: Restoration and change of line between Cedar, Utah, and Verde, \$256,000 (completed).

Detroit & Toledo Shore Line

Second Track: Wyandotte, Mich., to Slocum Jct., 5.3 miles.

Important Work Undertaken: Additional yard tracks, Lang, Ohio, \$164,000 (completed). Joint separation of grades with New York Central and Michigan Central River Rouge, Mich., \$600,000 (5 per cent completed).

Detroit Terminal

First Track: In Michigan, 1.16 miles.

Second Track: In Michigan, 5.03 miles.

Detroit, Toledo & Ironton

Second Track: Flat Rock, Mich., to Durban, 16.19 miles.

Important Work Undertaken: (Detroit & Ironton) Line, Durban, Mich., to Malinta, Ohio, 55.71 miles. Electrification of main line, Fordson, Mich., to Flat Rock, \$950,000 (85 per cent completed).

Duluth & Iron Range

Important Work Undertaken: Reconstruction of coal pockets and coal dock, Two Harbors, Minn., \$110,000 (75 per cent completed).

Duluth, Missabe & Northern

Important Work Undertaken: Yard tracks, Hibbing, Minn., 8.5 miles (completed).

Eastern & Western Lumber Co.

Important Work Undertaken: Line from Molalla, Ore., into timber holdings, 21 miles (grading completed).

Elgin, Joliet & Eastern

Important Work Undertaken: Bridge over DuPage river, Plainfield, Ill., \$100,000 (completed). Boiler house, East Joliet, Ill., \$265,000 (completed).

Erie

Important Work Undertaken: Elevation and elimination of tracks at grade crossings, engine terminal facilities and coach, team and passenger terminal tracks, Paterson, N. J. (85 per cent completed). Power plant consisting of two buildings of steel, concrete, hollow tile and brick construction and complete equipment, Jersey City, N. J. (95 per cent completed). Two-story steamship and lightering pier No. 9, of wood, steel and pre-cast concrete construction, Jersey City, N. J. (20 per cent completed). Track elevation and pedestrian subways, Jamestown, N. Y. (90 per cent completed). Brick passenger station, frame freight station and pedestrian subway to connect station platforms, Englewood, N. J. (99 per cent completed). Elimination of Main st., grade crossing in conjunction with New York Central, Suspension bridge, N. Y. (30 per cent completed).

Florence, Clifton & Paducah

Important Work Undertaken: Line, Florence, Ala., to Paducah, Ky., 226 miles.

Florida East Coast

First Track: St. Lucie Canal, Fla., to Canal Point, 10.9 miles. Larkin, Fla., to Hialeah, 11.5 miles. St. Augustine, Fla., to Bunnell, 29.5 miles.

Second Track: S. Jacksonville, Fla., to Miami, 199 miles. Little River, Fla., to Hialeah, 7.5 miles.

Important Work Undertaken: Bowden terminal, south of Jacksonville, Fla., \$1,500,000 (80 per cent completed). Miller shops, St. Augustine, Fla., \$1,000,000 (30 per cent completed). Receiving tracks, Ft. Pierce, Fla., \$125,000 (60 per cent completed). Freight facilities, West Palm Beach, Fla., \$200,000 (50 per cent completed). Hialeah terminal, Fla., \$2,000,000 (60 per cent completed). Steel viaduct over Sebastian river, Ft. Pierce, Fla., \$725,000 (15 per cent completed). Viaduct over Crane creek, Melbourne, Fla., \$300,000 (5 per cent completed). Viaduct over Elbow creek, Eau Gallie, Fla., \$300,000 (2 per cent completed).

Great Northern

First Track: Scobey, Mont., to Peerless, 19.92 miles.

Second Track: Kelly Lake, Minn., to Emmert, 5.19 miles. At Java, Mont., 0.75 miles.

Important Work Undertaken: New line from Peerless, Mont., to Opheim, 28.87 miles. Electrification of line between Tye, Wash., and Skykomish (completed). Terminal post office building, Spokane, Wash. (completed). Replacing turntable, Hillyard, Wash. (completed). Steel coal chute, 250 ton, Sand Point, Idaho (completed). Raising grade and strengthening roadbed along Crab creek, Wash. (completed). Rebuilding the commissary building, St. Paul, Minn. (completed). Extension of seven passing tracks on the Montana division and tracks for sugar beet industries at Chinook, Mont., and Bellingham, Wash. (completed). Changes of grade, approximately three miles, to get 0.4 east bound, Spokane division (completed). Steel bridges replacing timber bridges, 3,371 lin. ft. Bridges (steel) reinforced, 669 lin. ft. (completed). Concrete trestle and slab bridges in place of timber, 3,383 lin. ft. (completed). Timber bridges filled, 3,712 lin. ft.

Gulf Coast Lines

Important Work Undertaken: (St. Louis, Brownsville & Mexico) New line from Raymondville, Tex., to Edinburg, 30 miles. From Allendale, Tex., to Monte Christo, 10 miles. From Hargill, Tex., to end of spur, 10 miles. (New Orleans, Texas & Mexico): Remodeling, improving and enlarging shop and yard facilities, DeQuincy, La., \$206,000 (90 per cent completed).

Hampton & Branchville

First Track: Smoaks, S. C., to Risher, 14 miles.

Important Work Undertaken: Line, Risher, S. C., to Cottageville, 10 miles.

Hocking Valley

Second Track: Between Columbus, Ohio, and Toledo, 53.14 miles.

Important Work Undertaken: Addition of 19 tracks to classification yard, Walbridge, Ohio, \$347,000 (completed). Additional tracks in operating yard and enlargement of car repair shops, Parsons, Ohio, \$500,000 (completed).

Illinois Central

Second Track: (Yazoo & Mississippi Valley.) Baton Rouge, La., 0.43 miles.

Important Work Undertaken: Line Akin Jct., Ill., to West Frankfort Jct., 7.3 miles. From Edgewood, Ill., to Fulton, Ky., 166.2 miles. Yards, shops, and engine terminal facilities at Markham yard, Homewood, Ill., \$10,450,000 (90 per cent completed). Grade revision 27th to 51st streets, repairs to breakwater, reconstruction of retaining wall, sewer changes, additional tracks and other facilities, Chicago, \$5,082,000 (90 per cent completed). Separation of grades with Pennsylvania and Baltimore & Ohio, Chicago terminal, Riverdale, Ill., \$2,027,000 (85 per cent completed). Grade separation with Grand Trunk and Baltimore & Ohio Chicago terminal, and elevation of tracks through Harvey, Ill., \$3,809,000 (95 per cent completed). Separation of grades with Alabama & Vicksburg and elevation of tracks, Jackson, Miss., \$1,929,000 (55 per cent completed). Rearrangement of tracks and installation of hump, scales and car retarders, East St. Louis, Ill., \$976,500 (completed). Mechanical facilities, Sioux City, Iowa, \$663,640 (completed). Freight depot, Indianapolis, Ind., \$181,000 (completed). Shop facilities, Paducah, Ky., \$6,099,220 (25 per cent completed). Remodeling and enlarging passenger depot, Jackson, Miss., \$221,500 (5 per cent completed).

(Yazoo & Mississippi Valley.) Passenger station facilities, Baton Rouge, La., \$758,000 (completed).

Indianapolis Union

Important Work Undertaken: Contract executed between this company and the City of Indianapolis, Ind., covering the elevation of 7 miles of Belt R. R. in that city, which will involve the relocation and reconstruction of the Belt locomotive repair shops, elimination of 23 street grade crossings and 4 railroad grade crossings, construction of a 5-track bridge near White river, and a classification yard of 500-car capacity; estimated cost \$13,000,000.

International-Great Northern

Important Work Undertaken: Yard tracks, approximately 50,000 ft. Percival yard, Tex., \$138,600 (completed).

Jackson & Eastern

First Track: Walnut Grove, Miss., to Lena, 10 miles.

Important Work Undertaken: New line from Lena, Miss., to Jackson, 40 miles.

Jefferson & Northwestern

Important Work Undertaken: Extension of line from Marietta, Tex., to Naples, 10 miles.

Kansas City Southern

First Track: Lawton, Kans., to Military, 6.68 miles.

Important Work Undertaken: Grade revision, bridges, building, and 15 miles of yard tracks, Shreveport, La., \$500,000 (completed). Joint construction with Texas & Pacific of 2.5 miles of tracks and bridge across Cross Bayou, Shreveport, La., \$165,000 (95 per cent completed).

Kansas City Terminal

Important Work Undertaken: Reinforced concrete subway, carrying 7 tracks over Indiana avenue, Kansas City, Mo., \$220,000 (completed).

Kansas, Oklahoma & Gulf

First Track: Baxter Springs, Kan., to Military Jct., 6 miles.

Lehigh & New England

Important Work Undertaken: Enginehouse, shop and other terminal facilities, Tamaqua, Pa., \$548,000 (completed).

Lehigh Valley

Important Work Undertaken: Replacing viaduct bridge with a steel and concrete viaduct and construction of passenger and freight stations with baggage and express facilities and track changes, Easton, Pa. (60 per cent completed). Elimination of grade crossing, Perth Amboy, N. J. Highway bridge over Washington street, Perth Amboy, N. J. (completed). Depression of Central Railroad of New Jersey, Perth Amboy, N. J. (completed). Replacing of a single track through truss bridge over the Susquehanna river, Coston, Pa. Thirteen-stall enginehouse and office building, Lehigh, Pa. (97 per cent completed).

Long Island

Important Work Undertaken: Float bridges, additional tracks and rearranging branch, covering 2 miles, in North Shore freight yard, N. Y., \$1,042,000 (completed).

Longview, Portland & Northern

First Track: In Washington, 0.65 miles.

Louisiana Railway & Navigation Company

First Track: Moreauville, La., to Hamburg, 2.5 miles.

Important Work Undertaken: Relocation of line between Hamburg, La., and the west bank of the Mississippi river, near Red River Landing, including a steel bridge over Atchafalaya river, Simmesport, \$2,000,000 (15 per cent completed).

Louisville & Nashville

Second Track: Wenrick, Ky., to Acosta, 1.74 miles. Cardinal, Ky., to Harlan, 17.97 miles. Slate Lick, Ky., to Conway, 5.12 miles. Peritte, Ky., to Tupo, 6.43 miles.

Important Work Undertaken: Second track, including erection of single track bridge across Kentucky river, construction of 3 tunnels of 980 ft., aggregate length, from Patio, Ky., to Ft. Estill, \$2,885,000 (5 per cent completed). Rigolets, La., bridge, \$3,128,000 (97 per cent completed). Chef Menteur bridge, 19 miles north of New Orleans, La., \$1,513,871 (87 per cent completed). Filling bridges south of Louisville, Ky., \$507,000. Superstructure for single track Green river bridge, Munfordville, Ky., \$330,000 (95 per cent completed). Superstructure for single track bridge over Tennessee river, Knoxville, Tenn., \$200,000 (90 per cent completed). Superstructure and piers for double track crossing, Latonia, Ky., \$370,000 (80 per cent completed). Steel viaduct near Cincinnati, Ohio, \$200,000 (50 per cent completed). Three 145-ft. double track truss spans on new masonry foundation, Cumberland Valley division, \$300,000 (80 per cent completed). Passenger station, Bowling Green, Ky., \$170,534 (completed). Shops, Corbin, Ky., \$175,580 (completed). Mechanical department buildings, Gentilly, La. (completed).

Manistee & Repton

First Track: Snider, Ala., to Jones Mill, 1.25 miles.

Mississippi & Schoona Valley

First Track: Bruce Jct., Miss., to Bruce, 6.5 miles.
Important Work Undertaken: Completion of line from Bruce Jct., Miss., to Bruce, 15.5 miles.

Missouri-Kansas-Texas

Important Work Undertaken: Enlargement of terminal yard by construction of 8 train tracks, 2 additional storage tracks, rearrangement of main and second track and installation of a 75-ton track scale, Ft. Worth, Texas, \$300,000 (completed). Steel car shop equipped with an outside crane runway extension and two overhead traveling cranes, Denison, Texas, \$130,000 (95 per cent completed). Joint construction with Missouri Pacific and city of Nevada, Mo., of concrete street subway under Missouri-Kansas-Texas and Missouri Pacific tracks, Nevada, Mo., \$160,000 (Missouri-Kansas-Texas portion completed).

Missouri Pacific

First Track: Epps, La., to Delhi, 10.02 miles. At end of track, Glencoe Branch, Mo., 0.62 miles. At end of track, Lenora, Kan., 0.02 miles.
Second Track: Cypress Jct., Ark., to Alexandria, 6.05 miles. Bauxite Jct., Ark., to Benton, 5.18 miles. Eureka, Mo., to Allentown, 2.63 miles. M.P. 73.13, Mo., to Berger, 4.87 miles. M.P. 90, Mo., to M.P. 108.85, 18.85 miles. Osage, Mo., to Algo, 3.65 miles.
Important Work Undertaken: Passing siding improvements, St. Louis district, \$171,625 (completed). Ten stall enginehouse, St. Louis, Mo., \$151,500 (completed). Six stall enginehouse, Bush, Ill., \$115,230 (completed). Sheep feeding facilities, Leeds, Mo., and Osawatomie, Kan., \$158,125 (completed). Eight stall enginehouse, Osawatomie, Kan., \$107,000 (completed). Bank restoration and rebalasting operation from Bardel, Kan., to Gilbert, \$256,300 (completed). Grain dryer, work house and sheds, Kansas City, Mo., \$600,000 (20 per cent completed). Spur to serve Columbia Quarry, Columbia, Ill., \$165,000 (10 per cent completed). Spur to serve Old Ben Mine No. 14, Zeigler, Ill., \$161,000 (75 per cent completed). Reconstruction 14th St. viaduct, St. Louis, Mo., \$145,620 (completed). Strengthening various bridges on system, \$1,300,000 (completed). Hospital, Little Rock, Ark., \$500,000 (completed). Reconstruction of bridge, Osage, Mo., \$292,000 (completed). Orient mine spur, Benton, Ill., \$216,000 (completed). Filling timber trestles, White river division, \$154,000 (completed).

Mobile & Ohio

Important Work Undertaken: Modern shop facilities, including extensions to yard tracks, Iselin, Tenn., \$1,265,565 (completed). Reclamation shop, shed for wrecker, coal and sand facilities, Murphysboro, Ill., \$100,000 (completed). Roundhouse, boiler room, water tank, wood mill building, storehouse, freight station, etc., Murphysboro, Ill.

Monongahela

Important Work Undertaken: Stone harbor wall and additional tracks at Brownsville passenger terminal, Brownsville, Pa., \$152,882 (completed). Machine, car and erecting shops, South Brownsville, Pa., \$140,000 (completed).

National Coal

First Track: National Jct., Utah, to Union, 8.9 miles.

New York Central

First Track: Stuyvesant, N. Y., to Schedack Jct., 9 miles. Gardenville, N. Y., to West Shore R. R., 1.94 miles.
Second Track: Albion, N. Y., to Eagle Harbor, 1.8 miles. (Cleveland, Cincinnati, Chicago & St. Louis) At Bellefontaine, Ohio, 1.5 miles. Morgan, Ohio, to Mix, 6.16 miles.

Important Work Undertaken: Enlarging and altering passenger facilities, Grand Central Terminal, \$264,000 (75 per cent completed). Elevator and improvements on other elevators, Grand Central Terminal, \$160,000 (projected). Additional storage battery facilities, Grand Central Terminal, \$235,000 (completed). Improvements to floor system of bridge, New York, \$109,000 (40 per cent completed). Excavation and miscellaneous work for Grand Central terminal facilities, \$545,000 (70 per cent completed). Strengthening and improving bridges, New York, \$132,000 (10 per cent completed). Additional facilities on electric division, \$124,000 (5 per cent completed). Live poultry facilities, New York, \$133,000 (completed). 20,000 K.W. turbo-generator, Fort Morris, N. Y., \$680,000 (completed). Extending boiler house, replacing boilers and installing steam line between car shops and heating plant, Mott Haven, N. Y., \$220,000 (60 per cent completed). Station improvements, Fordham, N. Y., \$500,000 (10 per cent completed). Electrification of various yards and sidings, Mt. Vernon, N. Y., \$123,000 (50 per cent completed). Rebuilding high tension feed switches and machine switches, Port Morris, N. Y., \$344,000 (5 per cent completed). Retirement of storage batteries in four substations, electric division, \$618,000 (completed). Electrification of various yards and sidings, Melrose, N. Y., to Port Morris, \$244,000 (35 per cent completed). Electrification of various yards and sidings, High Bridge, N. Y., to Croton, \$318,000 (25 per cent completed). Electrification of main line from Sedgewick Ave., to Van Cortlandt Jct., also on Yonkers branch, N. Y., \$1,416,000 (15 per cent completed). Elimination of grade crossing, Van Cortlandt, N. Y., \$120,000 (projected). Extension to Kings Bluff yard, Weehawken, N. J., \$100,000 (completed). Widening pier No. 6, and installing cranes, Weehawken, N. J., \$350,000 (completed). Elimination of grade crossing and revision of grades, Teaneck, N. J., Bogota and Ridgefield Park, \$904,000 (completed). Elimination of grade crossing, Tarrytown, N. Y., \$529,000 (80 per cent completed). Reconstruction of bridge, Crafts, N. Y., \$112,000 (completed). Removing roof of tunnel, Camelot, N. Y., \$350,000 (completed). Elimination of grade crossing, Newburgh, N. Y., \$438,000 (5 per cent completed). Construction Hudson River Connecting Railroad, including Selkirk yard and high level bridge, Selkirk, N. Y., \$25,000,000 (98 per cent completed). Rebuilding upholstery shop, West Albany, N. Y., \$211,000 (completed). Bridge renewal, Hoffmans, N. Y., \$143,000 (completed). Track changes, Little Falls, N. Y., \$133,000 (completed). Elimination of grade crossing, Pittsford, N. Y., \$108,000 (5 per cent completed). Rebuilding bridge, East Syracuse, N. Y., \$257,000 (75 per cent completed). Elimination of grade crossing, Rochester, N. Y., \$453,000 (10 per cent completed). Elimination of grade crossing, Oakfield, N. Y., \$111,000 (5 per cent completed). Elimination of grade crossing, Watertown, N. Y., \$123,000 (completed).

Connection between main line and West Shore, and between Gardenville and West Shore, near Depew, N. Y., \$1,700,000 (90 per cent completed). Purchase and conversion of Ferguson Steel Plant into paint shop, East Buffalo, N. Y., \$435,000 (completed). Elimination of grade crossing, Niagara Falls, N. Y., \$1,200,000 (25 per cent completed). Replacing boilers, additional generator and crane in power house, Avis, Pa., \$397,000 (10 per cent completed). Grade separation, Forsyth, N. Y., \$222,200 (completed). Grade separation, Erie, Pa., \$343,000 (completed). Grade separation and passenger station, Erie, Pa., \$3,000,000 (15 per cent completed).

Grade separation, Conneaut, Ohio, \$415,000 (25 per cent completed). Grade separation, Ashtabula, Ohio, \$270,000 (25 per cent completed). Storage yard tracks, Ashtabula Harbor, Ohio, \$155,700 (completed). Replacing ore bridge, Ashtabula Harbor, Ohio, \$360,000 (completed). Installation of improved car dumper, Ashtabula Harbor, Ohio, \$900,000 (completed). Grade separation, Painesville, Ohio, \$343,000 (completed). Passenger station, Youngstown, Ohio, \$400,000 (15 per cent completed). Renewal of bridge, Cleveland, Ohio, \$200,000 (completed).

Passenger station, Elyria, Ohio, \$300,000 (completed). Third and fourth tracks from Sandusky Jct., Ohio, to Huron, \$475,000 (25 per cent completed). Grade separation, Sandusky, Ohio, \$350,000 (20 per cent completed). Grade separation, Toledo, Ohio, \$230,000 (35 per cent completed). Grade separation, Detroit, Mich., \$300,000 (55 per cent completed). Grade separation, New Carlisle, Ind., \$100,000 (90 per cent completed). Bridges, Dune Park, Ind., \$293,000 (completed). Grade separation, Gary, Ill., \$250,000 (50 per cent completed). Strengthening bridges at 27 locations, Chicago, \$190,000 (completed). Machine shop, Gibson, Ind., \$130,000 (completed). Additional tracks, Gibson, Ind., \$100,000 (completed). Yard improvements, Gibson, Ind., \$235,000 (25 per cent completed). Yard improvements, West Kankakee, Ill., \$385,000 (70 per cent completed). (Toledo & Ohio Central.) Yard, Moline, Ohio, \$236,000 (completed). Car dumper, Toledo, Ohio, \$1,226,000 (50 per cent completed). (Michigan Central.) Grade separation, Detroit, Mich., \$600,000 (completed). Grade separation, Detroit, Mich., \$256,400 (completed). Grade separation, Toledo, Ohio, \$117,040 (80 per cent completed). Grade separation, Wayne, Ohio, \$224,484 (85 per cent completed). River dock, Detroit, Mich., \$510,000 (80 per cent completed). Extensive improvements and additional facilities, local freight terminal, Detroit, Mich., \$1,180,000 (45 per cent completed). Grade separation, Detroit, Mich., \$213,629 (85 per cent completed).

(Cleveland, Cincinnati, Chicago & St. Louis.) Second main track and grade revision from West Liberty, Ohio, to Glen Echo, \$1,760,000 (40 per cent completed). Freight house and yard, Dayton, Ohio, \$212,000 (completed). Second track and relocation from Gretna, Ohio, to Morgan, \$1,421,000 (80 per cent completed). Freight office, East St. Louis, Ill., \$154,000 (completed). Engine terminal, Kankakee, Ill., \$264,000 (10 per cent completed). Grade separation, Columbus, Ohio, \$302,000 (60 per cent completed). Second main track and relocation from Bellefontaine, Ohio, to West Liberty, \$1,704,000 (10 per cent completed).

(Cincinnati Northern.) Yard, Van Wert, Ohio, \$273,000 (completed). (Evansville, Indianapolis & Terre Haute.) Main track relocation, Rogers, Ind., to Blackburn, \$157,000 (10 per cent completed).

(Pittsburgh & Lake Erie.) Grading, moving station building, constructing station subways and platforms, overhead highway bridge and tracks from Fallston, Pa., to College, \$670,000 (25 per cent completed). Additional tracks, Aliquippa, Pa., \$125,000 (completed). Extension of roundhouse, McKees Rocks, Pa., \$342,000 (completed). Extending terminal facilities and rearrangement of tracks, Newell, Pa., \$643,000 (completed). Twenty yard tracks, Newell East yard, East California, Pa., \$384,000 (completed). About one mile of industrial track, Douglass, Pa., \$105,000 (completed).

(Lake Erie & Eastern.) Filling for proposed yard, Brier Hill, Youngstown, Pa., \$700,000 (completed).

(Indiana Harbor Belt.) Line under survey from Blue Island, Ill., to La Grange, 16 miles. Additional tracks and facilities and purchase of right-of-way, Blue Island yard, Ill., \$375,000 (80 per cent completed). Passing track, Dolton, Ill., \$125,000 (80 per cent completed).

(Boston & Albany.) Station facilities, Springfield, Mass., \$3,000,000 (65 per cent completed).

New York, Chicago & St. Louis

Second Track: Old Fort, Ohio, easterly 1.5 miles.

Important Work Undertaken: Change of alignment, M.P. 408 to M.P. 410, in vicinity of Sorento, Ill., \$235,000 (15 per cent completed).

New York, New Haven & Hartford

First Track: At Botsford, Conn., 0.09 mile. At New Britain, Conn., 0.06 mile. At Putnam, Conn., 0.08 mile.

Important Work Undertaken: Mill building, machine shop, paint shed and necessary equipment for repair of floating equipment, Harlem River, N. Y., \$105,000 (completed). Grading for bulk yard, Harlem River, N. Y., \$160,000 (completed). Extension of electrical equipment repair shed, Van Ness, N. Y., \$700,000 (40 per cent completed). Twenty classification tracks, seven receiving and departure tracks, equipped with electric switch mechanism in classification yard, Hartford, Conn., \$630,000 (70 per cent completed). Five additional classification tracks and bridge, Worcester, Mass., \$168,000 (85 per cent completed). Elimination of grade crossing, Middletown, Conn., \$230,000 (completed). Electrification of approximately 25 miles of track between South Norwalk, Conn., and Danbury, \$500,000 (completed).

Norfolk & Western

Second Track: On Big Sandy line, 35.04 miles. On Tug Fork branch, 5.13 miles.

Important Work Undertaken: Extending 14 passing sidings, Cincinnati Line, \$560,000 (2 per cent completed). Yard extensions, Williamson, W. Va., and Portsmouth, Ohio, \$5,346,000 (1 per cent completed). Shop buildings, Williamson, W. Va.; Portsmouth, Ohio, and Bristol, Va., \$3,100,000 (1 per cent completed). Elimination of grade crossings, Columbus, Ohio, and other points, \$2,350,000 (10 per cent completed). Bridge extensions and improvements at various points, \$550,000 (25 per cent completed). Water supplies at various points, \$200,000 (5 per cent completed).

Northern Pacific

First Track: Stimson, Wash., to Shelton, 15.25 miles.

Important Work Undertaken: New line from Oro Fino, Idaho, to Headquarters, 40.9 miles. Ore dock extension, Superior, Wis., \$866,700 (90 per cent completed). Coach yard, St. Paul, Minn., \$611,820 (completed). Grade separation, Johnson St., Minneapolis, Minn., \$334,970 (completed). Power plant, Brainerd, Minn., \$565,000 (completed). Line change, Lincoln Hill, Minn., \$376,610 (completed). Extension Elma, Wash., to Shelton, \$700,000 (completed). Replacement of bridge, Big Horn, Mont., \$104,950 (completed). Reinforcing bridge, Granite, Idaho, \$172,710 (completed).

Pennsylvania System

First Track: S. Penn branch, Pa., to Mercersburg branch, 0.16 miles. South of Wildwood Crest, N. J., 1.32 miles.

Second Track: In Philadelphia, Pa., 0.36 miles. At Girard Jct., Pa., 0.54 miles. At Austinburg, Ohio, 0.09 miles. Highland, Ohio, to Cromers, 4.37 miles.

Third Track: At Haselton, Ohio, 0.03 miles.

Fourth Track: At Haselton, Ohio, 0.01 miles.

Important Work Undertaken: Additional passenger facilities including 6 additional tracks at Sunnyside yard, Long Island City, N. Y., \$200,000 (completed). Replacing light bridge over York St. main line with heavier

bridge, Philadelphia, Pa., \$101,818 (completed). Replacing light bridge over Schuylkill river with heavier girders, Philadelphia, Pa., \$162,250 (completed). Replacing light bridge over Lehigh Ave., main line with heavier bridge, Philadelphia, Pa., \$150,000 (75 per cent completed). Replacing light deck plate girders of bridge over Cordonus creek with heavier deck girders, west of York, Pa., \$106,200 (60 per cent completed). Classification and pull-in tracks at Dillerville, Pa., \$125,600 (completed). Extending enginehouse stalls, Enola, Pa., \$144,376 (completed). (Extending 18 stalls of enginehouse, East Altoona, Pa., \$104,413 (completed)).

First unit of office building, Philadelphia, Pa., \$3,300,000 (1 per cent completed). Track elevation, South Philadelphia, Pa., \$25,000,000 (30 per cent completed). Two bridges over north branch, Susquehanna river, Sunbury, Pa., to Northumberland, \$1,655,000 (completed). Overhead bridge at 17th St., Renovo, Pa., \$135,000 (completed). Railway express terminal, Long Island City, N. Y., \$2,300,000 (10 per cent completed). Reconstruction of Summit Ave., overhead bridge, Jersey City, N. J., \$435,000 (completed). Overhead bridge at Dayton Road, Monmouth Jct., N. J., \$115,000 (completed). Improving passenger facilities at Clinton St. station, including high platforms and a passenger bridge, Trenton, N. J., \$1,560,000 (60 per cent completed). Float bridge and westward operating facilities, Greenville yard, Jersey City, N. J., \$430,000 (completed). Stony Creek engine and car facilities, South Chester branch, Thurlow, Pa., \$825,000 (completed). Additional yard tracks, Thurlow, Pa., \$200,000 (completed). Overhead bridge at Marsh Road, Edge Moor, Del., \$240,000 (completed). Reconstruction of bridge over Chesapeake and Delaware canal, Canal, Del. (one-third cost), \$660,000 (60 per cent completed). Undergrade crossing, Portage, Pa., \$151,000 (80 per cent completed).

Increased yard facilities, south side, Pittsburgh, Pa., \$330,000 (completed). Reconstruction of Beck's Run viaduct, Hays, Pa., \$500,000 (completed). Additional classification tracks, Shire Oaks, Pa., \$117,000 (completed). Relocating Grant St., and auxiliary changes, Pittsburgh, Pa., \$578,000 (25 per cent completed). Wye track at junction of Cleveland and Pittsburgh division with Wheeling division, Yellow Creek, Ohio, \$446,000 (75 per cent completed). Additional tracks and line changes, Emsworth, Pa., \$225,000 (completed). Relocation of main line through New Brighton, Pa., and reconstruction of bridge over Beaver river, West Rochester to Beaver Falls, Pa., \$3,040,000 (75 per cent completed). Low grade freight line, Canton, Ohio, to Bayard, \$4,400,000 (60 per cent completed). Track elevation, Cedar Ave., to Holton Ave., Cleveland, Ohio, \$2,985,000 (80 per cent completed). Extension of ore handling facilities, Dock No. 10, Ashtabula Harbor, Ohio, \$105,000 (completed). Subway at Center St., Ashtabula, Ohio, \$225,000 (4 per cent completed). Reconstruction of bridge over Ohio river, Steubenville, Ohio, \$1,945,000 (44 per cent completed). Track elevation work, Ft. Wayne, Ind., \$1,192,000 (80 per cent completed). Grade separation, Columbus, Ohio, \$345,000. Freight house, Cincinnati, Ohio, \$400,000 (completed). Replacement of No. 2 coal machine, Sandusky, Ohio, \$805,200 (completed). Power house, oil house, boiler washing system, turntable and flood lighting system at outer yard, Toledo, Ohio, \$277,573 (75 per cent completed). Renewal of bridge over Baltimore & Ohio, Toledo, Ohio, \$159,369 (projected). Separation of grades at Main St., Toledo, Ohio, \$680,208 (projected). Second track and grade reduction, Altamont, Ill., to Brownstown, \$550,000 (15 per cent completed). Second track and grade reduction, Pierron, Ill., to St. Jacob, \$904,000 (10 per cent completed). Subway to 9th St., East St. Louis, Ill., \$216,000 (completed). Joint track elevation with the city and county, Indianapolis, Ind., \$345,000 (1 per cent completed). Twelfth St., viaduct, Chicago, \$475,000 (completed). Industrial track, Darlington, Ohio, \$250,000 (17 per cent completed). Track elevation from 39th St. to 59th St., Chicago, \$790,000 (completed). Replacement of car dumper on Dock No. 1, Sandusky, Ohio, \$960,000 (completed). Reconstruction of Court St. freight station, Cincinnati, Ohio, \$355,000 (completed).

Pere Marquette

Important Work Undertaken: Extension Oak Yard, Detroit, Michigan, \$120,000 (40 per cent completed). Grade separation, Plymouth road, \$109,000 (75 per cent completed). Passing tracks and sidings, \$160,000 (completed).

Portland Terminal

Important Work Undertaken: Reconstruction of highway bridge and approaches, So. Portland, Me., \$125,000 (completed).

Quanah, Acme & Pacific

Important Work Undertaken: New line projected from MacBain, Tex., to Floydada, 30 miles, \$1,000,000.

Reader

First Track: Reader, Ark., to Waterloo, 23.5 miles.

Reading

First Track: Extension of east and west connection of the Wilmington & Northern with the main line of Birdsboro, Pa., 0.08 miles.

Important Work Undertaken: Fourth track between Monocacy, Pa., and Birdsboro, 1.42 miles, \$199,800 (10 per cent completed). Joint construction, with county and township, of a concrete and steel viaduct to carry Washington Lane over tracks, Jenkintown, Pa., \$105,000 (completed). Two-story office building with brick extension over freight house, Lebanon, Pa., \$173,000 (92 per cent completed). Reinforced concrete shipping pier, docks and equipment, Port Richmond, Pa., \$3,800,000 (10 per cent completed). Grain elevator, Philadelphia, Pa., \$284,000 (completed). Steel frame freight car repair shop and engine yard facilities, Reading, Pa., \$2,014,000 (30 per cent completed).

Change of alignment and replacement of viaduct, Mainville, Pa., \$248,300 (projected). Change of alignment and construction of concrete arch bridge, Ringtown, Pa., \$680,000 (75 per cent completed). Coaling station, sand house, ash pits, inspection pit, new storage tracks, etc., Rutherford, Pa., \$456,000 (completed). Change of alignment of track and Schuylkill river channel, Port Clinton, Pa., \$475,000 (80 per cent completed). New ore handling machinery, power equipment and necessary track work, Pier 14, Port Richmond, Pa., \$772,200 (40 per cent completed). Replacing bridges, Birdsboro, Pa., \$387,562 (completed). Joint construction of union station with Lehigh Valley, Bethlehem, Pa., \$362,000 (completed). Joint replacing of highway bridge with County of Berks, Borough of Wyomissing and others, Wyomissing, Pa., \$114,468 (completed).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: Double track bridge over Rappahannock river, track elevation eliminating 4 grade crossings, and extension of passenger station, Fredericksburg, Va., \$1,000,000 (0.5 per cent completed). Low grade southbound freight line passing under double track passenger main line, Potomac yard, Va., \$150,000 (0.5 per cent completed).

St. Louis-San Francisco

Second Track: (Kansas City, Ft. Scott & Memphis.) At Springfield, Mo., 0.36 miles.

St. Paul Bridge & Terminal

First Track: At St. Paul, Minn., 0.19 miles.

San Benito & Rio Grande Valley

First Track: Kern Jct., Tex., to Sammons, 32.12 miles.

San Francisco, Napa & Calistoga

Important Work Undertaken: Relocation of line from Marsh, Cal., to Wharf, 0.85 miles.

San Joaquin & Eastern

Important Work Undertaken: New line from Dawn, Cal., to Shaver, 4.5 miles.

Seaboard Air Line

First Track: Near Savannah, Ga., 1.68 miles. (Florida Western & Northern.) Gross, Fla., to Callahan, 12.93 miles. Varico, Fla., to Welcome Jct., 11.66 miles. (Brooksville & Inverness.) Brooksville, Fla., to Inverness, 22.54 miles. **Second Track:** Maxville, Fla., to Highland, 7 miles. **Important Work Undertaken:** Yard and shop facilities, Baldwin, Fla. (completed). Yard and shop facilities, Wildwood, Fla. (completed). Replacing 3 truss spans, Haw river bridge with 6 deck plate girder spans, near Moncure, N. C. (completed).

Sierra Ry. Co. of California

First Track: McCormick Jct., Cal., to new dam location, 8.52 miles.

Southern

First Track: At Spartanburg, S. C., 3.06 miles. Bulls Gap, Tenn., to Leadville, 17.16 miles. Beverly, Tenn., to John Sevier yard, 3.98 miles.

Second Track: Beverly, Tenn., to John Sevier yard, 3.98 miles. **Important Work Undertaken:** Industrial spur, Birmingham, Ala., \$252,000. Freight yard, Chattanooga, Tenn., \$1,051,000. Freight yard and engine terminal, John Sevier, Tenn., \$3,750,000 (completed). Car repair plant, Hayne, S. C., \$1,590,000 (completed). South shops, Atlanta, Ga., \$900,000 (completed). Engine terminal and coach yard, Atlanta, Ga., \$550,000 (completed). Engine terminal and freight yard extension, Asheville, N. C., \$810,000 (completed). Roundhouse and additional shop facilities, Spencer, N. C., \$550,000 (completed). Shops and engine terminal, Princeton, Ind., \$452,000 (completed).

Southern Pacific System

First Track: (Southern Pacific.) Hinsdale, Cal., to Josephine, 5.66 miles. Valley Spring, Cal., to North Fork, 8.13 miles.

(Central Pacific.) Faunina, Ore., to Planton, 29.53 miles. (Arizona Eastern.) Near Poston, Ariz., to West of Florence, 6.34 miles. East of Tempe, Ariz., to Tempe, 1.88 miles. (Pacific Electric.) In Burbank, Cal., 1.01 miles. In Loserritos, Cal., 2.75 miles. Extension, Long Beach, Cal., 3 miles. **Second Track:** (Southern Pacific.) Emigrant Gap, Cal., to Andover, 21.09 miles. Shorb, Cal., easterly, 0.47 miles. (Pacific Electric.) In Pasadena, Cal., 0.49 miles. In Los Angeles, Cal., 1.2 miles.

Important Work Undertaken: (Southern Pacific.) Acquisition of right-of-way and construction of connecting track between north and south lines so that former El Paso & Southwestern line can be used as second track, Polvo, Ariz., and Mesal, \$185,000 (completed). Additional yard tracks, West Oakland, Cal., \$100,000 (completed). Additional yard tracks, oil storage tank and yard buildings, Nutglade, Cal., \$132,000 (50 per cent completed). Renewal of timber lining in tunnel, additional section of a program, Hasson, Cal., \$250,000 (75 per cent completed). Replacing Phoenix truss bridge with through pin connected spans, Springfield, Ore., \$121,000 (10 per cent completed). Replacement of timber trestle with steel viaduct, Cochran, Ore., \$157,000 (20 per cent completed). Two-retort creosoting plant complete with new boiler house and necessary yard facilities, West Oakland, Cal., \$520,000 (completed). One-retort creosoting plant complete with necessary yard facilities, Blair, Ore., \$350,000 (75 per cent completed). Reinforced concrete coaling plants, at various stations in Arizona and New Mexico, \$323,000 (75 per cent completed). Rebuilding timber wharf and steamer shed, Sacramento, Cal., \$205,000 (completed). Rehabilitation and conversion to standard gage of former Lake Tahoe Railway, Truckee, Cal., \$316,000 (10 per cent completed). Passenger station with necessary tracks, umbrella sheds, subways, etc., Sacramento, Cal., \$2,400,000 (60 per cent completed).

(Central Pacific.) New line from Planton, Ore., towards Oakridge, 35.97 miles. From Black Butte, Cal., to Grass Lake, 23.75 miles. Near Klamath Falls, Ore., to Alturas, Cal., 97 miles.

(Arizona Eastern.) New line from Picacho, Ariz., to Chandler, 49.6 miles. From Hassayampa, Ariz., to Wellton, 96.87 miles.

(Pacific Electric.) One mile subway, including subway terminal sub-surface, Los Angeles, Cal., \$4,000,000 (95 per cent completed).

(Morgan's Louisiana & Texas Railroad & Steamship Co.) Extension of line from end of Long Plantation Spur, La., Milton and Youngsville, \$213,812 (90 per cent completed). Dirt pit tracks and storage track, Schriever, La., \$134,843 (90 per cent completed).

(Texas & New Orleans.) Freight car repair shops, tracks, etc., Englewood, Tex., \$421,801 (completed). Water-front terminal development on Houston Ship channel to serve Morgan Line ships, Clinton, Tex., \$1,056,131 (85 per cent completed). Strengthening bridges, Beaumont, Tex., to Dallas, \$259,329 (completed). Viaduct with steel track span and long concrete trestle approaches, Beaumont, Tex., \$109,091 (completed). Six additional yard tracks, Englewood yard, Englewood, Tex., \$113,973 (75 per cent completed). Replacing open deck trestle with through riveted span and ballasted deck trestle, Bois D'Arc, Tex., \$131,215 (completed).

(Galveston, Harrisburg & San Antonio.) Rearrangement, replacement, expansion and improvement of engine terminal, fuel oil facilities, etc., El Paso, Tex., \$281,012 (completed). Relocating main line track between Langtry, Tex., and Osman, \$874,398 (3 per cent completed).

(Houston & Texas Central.) Belt line around city of Dallas, Tex., \$1,853,543 (85 per cent completed). Making surveys and purchase of right-of-way, etc., for Ft. Worth Belt line, Ft. Worth, Tex., \$253,000 (75 per cent completed). Rehabilitating and expanding engine terminal facilities by extending stalls of roundhouse, Houston, Tex., \$120,087 (10 per cent completed). Terminal yard and facilities, Miller, Tex., \$256,227 (95 per cent completed).

(San Antonio & Aransas Pass.) Replacing bridge over Brazos river, Simonton, Tex., \$430,593 (completed).

Terminal R. R. Assn. of St. Louis

Important Work Undertaken: Coach yard, St. Louis, Mo., \$1,500,000 (5 per cent completed).

Texas & Pacific

Second Track: Shreveport, La., to Cut-Off Jct., 4 miles.
Important Work Undertaken: Joint construction with Missouri Pacific, yard and engine terminal, Alexandria, La., \$1,000,000 (40 per cent completed). Yard and engine terminal, Shreveport, La., \$900,000 (completed). Grade revision from Marshall, Tex., to Longview Jct., \$200,000 (completed). Yard and engine terminal, Dallas, Tex., \$850,000 (75 per cent completed).

Toledo Terminal

Second Track: Stanley, Ohio, to Walbridge, 2.5 miles.

Union Pacific

First Track: (Oregon Short Line.) Orchard, Idaho, to Boise, Jct., 27.75 miles. Nampa Loop Jct., Idaho, to Nampa, 2.65 miles.
 (Oregon-Washington Railroad & Navigation.) Johns, Ore., to Prunedale, 0.52 miles.

Important Work Undertaken: Passenger station and freight depot, Topeka, Kan., \$400,000 (25 per cent completed). Viaduct, Kansas City, Kan., \$254,000 (25 per cent completed). Laying of 18-in. cast iron pipe line from Carter, Wyo., to Leroy, 15.4 miles, and erection of a 500,000 gal. concrete reservoir, Carter, Wyo., \$160,500 (completed).

(Oregon Short Line.) New line from Rogerson, Idaho, to Wells, Nev., 94 miles. Brick passenger depot, foot subway, etc., Nampa, Idaho, \$150,000 (completed). Brick passenger depot, paving, etc., Boise, Idaho, \$230,000. Station facilities, including 1.36 miles of trackage, section buildings, electrically operated coaling station, with power plant, Orchard, Idaho, \$107,000. First unit of power plant, boilers, turbo-generators and a motor generator, Pocatello, Idaho, \$390,000. Moving station facilities and rearrangement of main tracks and sidings, American Falls, Idaho, \$363,800 (75 per cent).

(Oregon-Washington Railroad & Navigation.) Cut widening, embankment restoration and drainage operations, Hilgard, Ore., to Kamela, \$183,445 (completed). Wharf on site of present Ainsworth dock, Portland, Ore., \$370,000 (completed).

(Los Angeles & Salt Lake.) Joint construction of reinforced concrete viaduct at Ninth St., over L. A. & S. L. and A. T. & S. F. tracks, Los Angeles, Cal. (L. A. & S. L.'s proportion), \$250,000 (completed). Joint construction of reinforced concrete viaduct and approaches at Macy St., across the Los Angeles river, L. A. & S. L. and A. T. & S. F. tracks, Los Angeles, Cal. (L. A. & S. L.'s proportion), \$135,000 (75 per cent completed). Terminal facilities including freight yards, engine terminals and shop facilities, Los Angeles, Cal., \$1,750,000 (completed). Engine terminal facilities, combination freight and passenger station and yard tracks, E. San Pedro, Cal., and Wilmington, Cal., \$232,000 (completed). Combination freight and passenger station, Glendale, Cal., \$154,000 (completed). Paving of franchise strip, Glendale, Cal., \$100,000 (completed). Local freight station with service tracks, Pasadena, Cal., \$186,000 (completed). Spur 10.6 miles long from Arden to Blue Diamond Quarry, Arden, Nev., \$223,000 (completed). Enlarging bore and relining 376 lineal feet of tunnel No. 5, with reinforced concrete, Elgin, Nev., \$150,000 (completed). Enlarging bore and relining 228 lineal feet of tunnel No. 15, with reinforced concrete, east of Big Springs, Nev., \$100,000 (5 per cent completed). Enlarging bore and relining 376 lineal feet of tunnel No. 16, with reinforced concrete, between Big Springs, Nev., and Islen, \$162,000 (15 per cent completed). Enlarging bore and relining 285 lineal feet of tunnel No. 17, with reinforced concrete, west of Islen, Nev., \$123,000 (completed). Lunch pavilion and tourist camp with equipment, Bryce Canyon, Utah, \$135,000 (completed).

Virginian

Second Track: M. P. 355.27, W. Va., to M. P. 360.41, 5.14 miles. M. P. 376.57, W. Va., to M. P. 377.29, 0.72 miles.

Important Work Undertaken: Electrification of 134 miles of line from Mullens, W. Va., to Roanoke, Va., including new power plant, transformer stations, \$10,663,000. Coal pier, Sewalls Point, Norfolk, Va., \$3,265,000.

Wabash

Second Track: Franklin, Ohio, to Ohio-Mich. state line, 4.32 miles. Ohio-Mich. state line to Ennis, Mich., 12.05 miles.

Important Work Undertaken: Grade separation, Detroit, Mich., \$250,000 (85 per cent completed). Grade separation, Oakwood, Mich., \$171,000 (10 per cent completed). Grade separation, Ft. Wayne, Ind., \$130,000 (75 per cent completed). Yard, N. Kansas City, Mo., \$1,300,000 (90 per cent completed). Yard, Montpelier, Ohio, \$340,000 (completed). Extension of yard, Oakwood, Mich., \$346,000 (completed). Yard, Decatur, Ill., \$100,000 (completed). Passenger stations, Decatur, Ill., Centralia and Taylorville, \$157,500 (completed). Dock wall and freight house extension, Detroit, Mich., \$150,000 (95 per cent completed). Passing and other stations tracks at various points, \$313,200 (completed). Fuel stations at various points, \$155,000 (completed). Water stations at various points, \$119,000 (completed). Steel car repair shop, Decatur, Ill., \$350,000 (completed). Bridges at various points, \$546,000 (completed). Car ferry, Detroit, Mich., \$1,000,000 (10 per cent completed).

Washington, Brandywine & Point Lookout

First Track: Mechanicsville, Md., to Forrest Hall, 2.3 miles.

Western Pacific

Important Work Undertaken: Branch from Villinger, Cal., to a point 1.5 miles south of Victor, 11.4 miles. Line from Lisbon, Cal., into Holland district, 13.0 miles. Yard and engine terminal, Stockton, Cal., \$800,000 (completed). Track in Industrial district, 1.5 miles, San Francisco, Cal., \$175,000 (10 per cent completed). Passing track extensions, \$105,000 (completed). Purchase of one-half interest in Alameda Belt line and extension of same to serve industrial zone, Alameda, Cal., \$175,000. Replacement of eight timber bridges with steel structures on system, \$410,000 (completed).

Wichita Falls & Southern

Important Work Undertaken: Rebuilding shops, Wichita Falls, Texas.

Winston-Salem Terminal

Important Work Undertaken: Union passenger station to be used by Southern, Norfolk & Western and Winston-Salem Southbound, Winston-Salem, N. C., \$300,000 (95 per cent completed).

Woodward Iron Company's R. R.

First Track: In Alabama, 2 miles.

Important Work Undertaken: Yard tracks, Woodward, Ala., 0.6 miles (completed). Additional yard tracks, Woodward, Ala., 2.5 miles.

Yosemite Valley

Important Work Undertaken: Relocation of main line between Merced Falls, Cal., and Detwiler, approximately 20 miles, \$3,500,000 (90 per cent completed). Restoring embankment and ballasting operations, 30 miles, \$150,000 (75 per cent completed).

Railway Construction in Canada**Alberta & Great Waterways**

First Track: In Alberta, 3.8 miles.

Important Work Undertaken: (Lacombe & Northwestern) new line, Alberta, 22.4 miles.

Algoma Central & Hudson Bay

Important Work Undertaken: Revision of 0.99 miles of line to eliminate timber trestles and heavy curvature and shorten distance, \$187,000 (com.).

Alma & Jonquiere

First Track: Ha Ha Bay Jct. to M. P. 3, County of Chicantecous, 3 miles.

Important Work Undertaken: New line, Shipshoro, Que., 5 miles.

Canadian National

First Track: Lockport Spur, N. S., 4.2 miles. Dunblane, Sask., to Butte, 12.5 miles. Turtleford, Sask., southeasterly, 35 miles. Eston, Sask., southeasterly, 35 miles. Hanna, Alta., to Warden, 62.1 miles. Loverna, Alta., westerly, 50 miles. Kamloops, B. C., to Armstrong, 56.5 miles. Vernon, B. C., to Kelowna, 33.5 miles. Lumby branch, B. C., 15.1 miles. Cowichan Bay branch, B. C., 7 miles. Vancouver Island main line, B. C., 10 miles.

(Grand Trunk.) At Port Colborne, Ont., 0.27 miles.
 (Niagara, St. Catharines & Toronto.) At St. Catharines, Ont., 0.23 miles. (Toronto Suburban.) Lambton, Ont., to Toronto, 254 miles.

Second Track: (Canadian Northern.) Mount Royal, Que., to Lazard, 3.35 miles.

(Niagara, St. Catharines & Toronto.) At St. Catharines, Ont., 0.34 miles.

Important Work Undertaken: Grading China Clay extension, Que., to St. Rem d'Amherst, 2.3 miles (completed). Grading Pine Falls branch, Man., 20 miles (completed). Grading new line from Dunblane, Sask., to Central Butte, 25.1 miles (completed). Grading new line from Bengough, Sask., to Willow Bunch, 23.8 miles (completed). Grading new line from St. Paul, Alta., southeasterly, 0.8 miles (completed). Terminal and facilities, North Sydney, N. S. (completed). Standardizing gage and replacing bridges and other facilities, Souris, P. E. I., Georgetown, and Montague, Terminal near Parry Sound, Ont. (completed). Bloor street subways, Toronto, Ont. (completed). Royce avenue subways, Toronto, Ont. (completed). Replacing trestle, M. P., 232.8, Minicuta, Man. (completed). Subway 101st St., and rearrangement of yard, Edmonton, Alta. (completed). Station, Jasper, Alta. (completed). Additions and improvements to park lodge, Jasper, Alta. (completed). Filling timber trestle, M. P. 17.1. Clearwater, B. C. (10 per cent completed). Filling and replacing frame trestle with reinforced concrete culvert, M. P. 102.9, Ashcroft, B. C. (completed). Replacing bridge over Silver creek, M. P. 41.95, Yale, B. C. (Canadian National Electric.) Replacing track, St. Catharines, Ont. (completed).

Canadian Pacific

First Track: Pivot, Sask., to Fox Valley, 27 miles. Diamond City, Alta., to Turin, 18 miles. Lomond, Alta., to Arrowwood, 31 miles. Amulet, Sask., to Cardross, 20 miles.

Important Work Undertaken: Grading new line from Battle River, Sask., to Lloydminster, Alta., 31 miles. Grading new line from Lloydminster, Alta., to Markwayne, 25 miles. Grading new line from Assiniboia, Sask., south, 12 miles. Grading new line from M. P. 12 Assiniboia, Sask., to M. P. 13 Fife Lake branch, 13 miles. Joint construction of subway under Canadian Pacific and Canadian National tracks at Bloor St., Toronto, Ont., \$800,000 (completed). Joint construction of subway under Canadian Pacific and Canadian National tracks at Royce Ave., Toronto, Ont., \$1,000,000.

Edmonton, Dunvegan & British Columbia

First Track: (Esquimalt & Nanaimo.) M. P. 3.75, to M. P. 10.3, Great Central Lake, on the Great Central Lake branch, 6.55 miles.

Roberval-Saguenay

First Track: Ha Ha Bay Jct., Que., to Shipshaw, 5 miles.

Singer Manufacturing Co.

Important Work Undertaken: New line in the Province of Quebec, 23.25 miles.

Temiskaming & Northern Ontario

First Track: (Nipissing Central.) Larder Lawe, Ont., to Cheminiss, 9 miles.

Toronto, Hamilton & Buffalo

Rock excavation for re-alignment and future double tracking between Stoney Creek, Ont., and Vinemount, \$454,000 (57 per cent completed).

Railway Construction in Mexico**Mexicali-San Felipe**

First Track: Sixteen miles in State of Lower California.

Important Work Undertaken: Eight additional miles under construction. Seventy-five miles more projected from the Colorado River southwest.

Mexican Railway Company, Ltd.

Important Work Undertaken: Extension of electrification in the mountainous sections of line between Orizaba and Coedopa (25 per cent).

National Railways of Mexico

First Track: Cienega de los Caballos, in Durango, 9.88 miles.

Important Work Undertaken: Terminal passenger station, Saltillo, \$142,000 (80 per cent completed). Mexican International, terminal passenger station, Durango, \$325,000 (completed).

Southern Pacific Railroad Company of Mexico

First Track: Tepic, Nayarit, to Ixtlan, 69 miles.

Important Work Undertaken: New line from Ixtlan, Nayarit to La Quemada, Jalisco, 21 miles. Fuel oil station, Ardilla Island near Guaymas, Sonora, \$150,000 (completed). Reconstruction of Rio Mayo bridge, Sonora, \$375,000 (completed). Reconstruction of roadway and bridges destroyed by revolutionary forces and washout, Sonora, \$236,000 (15 per cent completed). Reconstruction of Sinaloa River bridge, Sinaloa, \$390,000 (completed). Reconstruction of bridge, Ocoroni, \$260,000 (completed). Reconstruction of bridge, Mocorito, \$310,000 (20 per cent completed). Replacement of wood bridges and culverts over line with steel and concrete structures, \$1,300,000 (completed).

Western Railway of Mexico

First Track: Culiacan, Sinaloa, to Altata, 37.5 miles.

An Active Year in Interlocking and Signal Construction



New Color-light Signals Replace Semaphore on New York Central Four-track Line

More equipment placed in service during 1925 than in any year since 1914—Good prospects for extensive program in 1926

By John H. Dunn



One of the Illinois Central's New Interlockings Near Markham Yard

AUTOMATIC signaling installed in 1925, especially that on single track, showed an increase over that completed in 1924. Many roads, especially through the South, have enjoyed an unusual growth of traffic during the last few years and as a result busy single track divisions are being equipped with automatic signals and interlocking plants are being installed at crossings or junctions as the most effective and economical means of facilitating train movements. The expense of installing train control on 45 of the Class I roads, and the uncertainty as to developments of such apparatus, have curtailed expenditures for signaling and interlockings, and therefore, on the majority of roads, only those projects giving promise of decided savings have been carried out. In spite of these circumstances, it is of in-

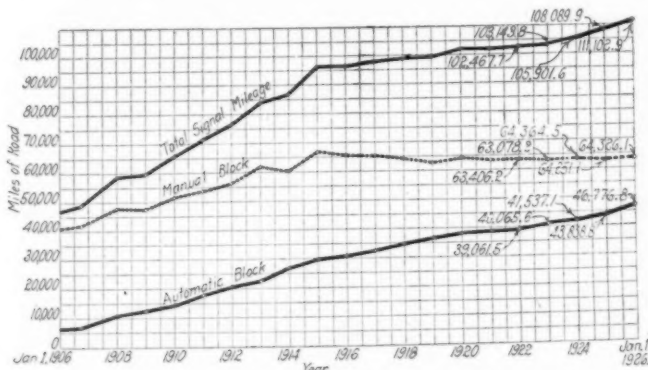
division of the Missouri Pacific where train movements are directed by signal indications without written train orders and passing track switches are handled by remote control apparatus. Following the completion of this installation a 20 per cent increase has been made in ton-miles per train hour, and the average speed over the division was increased 22.6 per cent.

Automatic Signaling Completed in 1925

A total of 2,641 miles of road, involving 3,847 miles of track, was equipped with automatic block signals in the United States and Canada during 1925. Single track signaling was installed on 2,107 miles of road, an increase of 436 over that for 1924. The four largest installations include 235 miles of color-light signals on the Seaboard Air Line; 207 miles of color-light signals on the Great Northern; 133 miles of position-light signals on the Norfolk & Western; and 140 miles of semaphore signals on the Louisville & Nashville. All four of the installations mentioned are on busy single track divisions and the signaling was provided for the purpose of securing added track capacity and greater safety of train operation.

The majority of the busy double track divisions, handling passenger as well as freight traffic, have been signaled. Therefore, as might be expected, the double track mileage signaled during 1925 is limited to rather short installations near terminals, on grades and on short stretches of new second track. The largest single installation of signaling on double track was 58 miles on the Santa Fe, which road made nine different installations on double track during the year, totaling 297 road miles. The Great Northern installed signals on four different sections of double track, totaling 74 miles of road. A total of 802 miles of double track lines was equipped with automatic signals in 1925, an increase of 38 miles over such installations made in the previous year.

Of all the automatic signals reported as installed in Canada and the United States during 1925, 2,209 are semaphore and 2,444 are light signals; 621 of the semaphores are lower quadrant type and 1,588 are upward quadrant, 371 of the light signals are of the position-light type and 2,000 are of the color-light type, while



Curves Showing Growth of Block System

terest to note that more miles of automatic signals were installed in 1925 than in any year since 1914.

Extensive change-overs replacing older types of semaphore automatic signals with light signals are noted for the first time in the records of signal activities of 1925. An item of equal interest is the removal of wayside automatic permissive signals on the Illinois Central where continuous train control with cab signals has been installed on a 122-mile division.

The outstanding accomplishment of signaling for 1925 is the successful operation of a 56-mile single track sub-

TABLE A—AUTOMATIC SIGNALS COMPLETED IN 1925—Continued

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
C. B. & O.	Ottumwa, Ia.	Chariton	24.4 d	61 S	Hall	.....
	Hannibal, Mo.	Monroe City	30.1 s	80 C	G. R. S.	.....
	Louisiana, Mo.	Clarksville	10.1 s	24 C	G. R. S.	.....
C. R. I. & P.	White City, Kan.	Latimer	7 d	4 S	U. S. & S.	.....
	Pt. Worth, Tex.	.....	.....	5 S	U. S. & S.	.....
	Various	.....	.....	.....	.....	13 F
C. & N. W.	Kickapoo, Ill.	Radnor	2 s	15 C	.....	.....
	Various	.....	.....	.....	.....	80 A
D. L. & W.	Lyndhurst, N. J.	Paterson Jct.	5.2 t	19 C	U. S. & S.	76 F
D. M. & N.	West Duluth, Minn.	.....	0.5 s	2 S	U. S. & S.	.....
D. T. & I.	Various	.....	.....	.....	.....	19 F
Erie	Jersey City, N. J.	Croston	2.2 f	.....	U. S. & S.	.....
G. N.	Kelly Lake, Minn.	Emmert	5 d	20 C	G. R. S.	.....
	Williston, N. D.	Wolf Point, Mont.	106.8 s	187 C	G. R. S.	.....
	Havre, Mont.	Cut Bank	100.6 s	232 C	G. R. S.	.....
	Cut Bank, Mont.	Blackfoot	28.7 d	31 S	G. R. S.	.....
	Java, Mont.	Summit	25.1 d	19 S	G. R. S.	.....
	Colmbia Falls, Mont.	Whitefish	12.5 d	12 S	G. R. S.	.....
	.....	.....	7.5 d	.....	.....	.....
I. C.	Kennington, Ill.	Richton	0.2 d	19 C	U. S. & S.	.....
	Memphis, Tenn.	McLennore Ave.	.....	2 C	U. S. & S.	.....
	Various	.....	.....	.....	.....	17 A
Y. & M. V.	Memphis, Tenn.	McLennore Ave.	0.1 d	1 C	U. S. & S.	18 F
	Memphis, Tenn.	Florida St.	.....	.....	.....	1 A
K. C. S.	Oskaloosa, Mo.	Mulberry	4.3 s	6 S	G. R. S.	3 A
L. V.	Jersey City, N. J.	.....	0.9 d	2 PC	G. R. S.	.....
	Pan Haven Jct., Pa.	Mc. Carmel	2.1 d	4 S	G. R. S.	.....
	Black Creek Jct., Pa.	Pine Jct.	1.4 d	2 S	G. R. S.	.....
	Newark, N. J.	Mc. Carmel, Pa.	8 d	12 F	G. R. S.	.....
	Various	.....	3.5 f	.....	.....	.....
L. & N. E.	Arlington, Pa.	.....	1 d	2 S	.....	4 F
L. & N.	Lou. FX Tower, Ky.	Strawberry	2 d	10 S	G. R. S.	.....
	Strawberry, Ky.	Lebanon Jct.	23.5 d	47 C	U. S. & S.	.....
	Lebanon Jct., Ky.	Bowling Green	83.5 s	178 S	G. R. S.	.....
	Bowling Green, Ky.	Memphis Jct.	5 d	21 S	G. R. S.	.....
	Memphis Jct., Ky.	Memphis, Tenn.	56.5 s	114 S	G. R. S.	.....
	N. Hazard, Ky.	Perritt	11 s	32 S	G. R. S.	.....
	Various	.....	.....	.....	.....	38 A
M. St. P. & S. S. M.	Various	.....	.....	.....	.....	3 A
M. P.	Bucyrus, Kan.	Oswatimie	21.6 s	55 C	Handlan	.....

Monongahela:	Eureka, Mo.	Allenton	2.6 d	5 C	C. R. S. & S.	.....
West Penn.	Fairmont, W. Va.	Clarksburg	21.3 s	26 S	Nachod	11 A
	Fairmont, W. Va.	Mannington	2.5 d	2 S	Nachod	3 F
	Fairmont, W. Va.	Marietta	0.9 s	4 S	Nachod	.....
	Clarksburg, W. Va.	City Lines	12.7 d	10 S	Nachod	.....
	Fairmont, W. Va.	City Lines	1.5 s	2 S	U. S. & S.	.....
	Fairmont, W. Va.	City Lines	1.5 s	2 S	U. S. & S.	.....
	Fairmont, W. Va.	City Lines	5.5 d	.....	.....	.....
N. C. & St. L.	Atlanta, Ga.	Balton	6 d	20 C	U. S. & S.	.....
	Cartersville, Ga.	Calhoun	30 s	62 C	U. S. & S.	.....
	Cartersville, Ga.	Ackworth	13 d	38 C	U. S. & S.	6 A
N. Y. C.	So. Palmyra, N. Y.	Churchville Jct.	34 d	68 C	Hall	.....
	So. Palmyra, N. Y.	Putnam Jct.	20 d	62 C	Hall	.....
N. Y. C. M. C.	Toledo, Ohio	Derroit, Mich.	50 d	101 C	G. R. S.	4 A
N. Y. O. & W.	Carbondale, Pa.	Jermyn, Pa.	.....	.....	.....	55 F
	.....	.....	.....	.....	.....	2 A
	.....	.....	.....	.....	.....	2 A

TABLE A—AUTOMATIC SIGNALS COMPLETED IN 1925

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
A. T. & S. F.	Chicago	Corwith	4.6 s	9 S	U. S. & S.	.....
	Medill, Mo.	Wyaconda	9.2 d	13 S	U. S. & S.	.....
	Wyaconda, Mo.	Baring	18.4 s	27 S	U. S. & S.	.....
	Baring, Mo.	La Plata	36.8 d	27 S	U. S. & S.	.....
	La Plata, Mo.	Bucklin	44 d	49 S	U. S. & S.	.....
	Rothville, Mo.	Standish	27.5 s	44 S	U. S. & S.	.....
	Spencer, Kan.	Pauline	14.2 s	29 S	U. S. & S.	.....
	Ridgerton, Kan.	Nescho Rapids	14.2 s	13 S	U. S. & S.	.....
	French, N. M.	Shoemaker	51.3 s	92 S	U. S. & S.	.....
	Wadous, N. M.	Las Vegas	19.9 s	38 S	U. S. & S.	.....
	Ardmore, Okla.	Thackerville	27.4 s	47 S	U. S. & S.	.....
	Ponetta, Tex.	Meridian	33.2 s	65 S	U. S. & S.	.....
	Swansea, N. M.	McCarty	33.8 d	34 C	U. S. & S.	47 A
	Various	.....	.....	.....	.....	.....
A. C. I.	Parkton, N. C.	Pee Dee, S. C.	56.1 d	105 S	U. S. & S.	.....
B. & O.	Lima Sta., Ohio	N. Lima	1.5 d	6 S	U. S. & S.	.....
	St. George, N. Y.	South Beach	4 d	24 CP	Hall	.....
	Tunnel No. 1, W. Va.	.....	.....	2 CP	Hall	.....
	Clifton Jct., S. I.	Tottenville, S. I.	12.5 d	41 CP	Hall	.....
	Tunnels 15, 16, 17, 18, W. Va.	.....	.....	4 CP	Hall	212 F
	Various	.....	.....	.....	.....	14 F
C. N.	Various	.....	.....	.....	.....	.....
Atl. Reg.	Cross Creek, N. B.	.....	1 s	2 S	G. R. S.	.....
	Mont Joli, P. Q.	.....	4 s	4 S	G. R. S.	3 A
	Various	.....	.....	.....	.....	.....
Cen. Reg.	Realties, N. H.	.....	0.5 s	1 S	G. R. S.	.....
	Norton Mills, N. H.	.....	0.5 s	1 S	G. R. S.	.....
	No. Stratford, N. H.	.....	0.5 s	1 S	G. R. S.	.....
	Rinfret Jct., P. Q.	.....	2.7 s	2 S	G. R. S.	.....
	Various	.....	4.5 d	4 C	U. S. & S.	.....
West. Reg.	Kamloops, B. C.	Terminals	1 d	2 S	G. R. S.	.....
	Bostock Jct., B. C.	New Westminster, B. C.	2 d	4 S	G. R. S.	.....
	Pt. Mann, B. C.	.....	3 s	6 C	U. S. & S.	.....
	Alta, Alta.	.....	1 s	1 S	G. R. S.	4 A
	Various	.....	.....	.....	.....	.....
C. P. Lines East	South Jct., Que.	St. Luc Jct.	1.4 d	8 S	Hall	.....
	Montreal West, Que.	North Jct.	0.8 s	1 S	G. R. S.	.....
Lines West	Westfort, Ont.	.....	2 s	2 S	U. S. & S.	.....
	Buda, Ont.	Finnmark	6.4 s	3 S	U. S. & S.	.....
	Oasquan, Ont.	.....	1.3 d	2 S	U. S. & S.	.....
	Osteraund, Ont.	.....	2 s	1 S	U. S. & S.	.....
	Austin, Man.	Sidney	12.4 s	5 S	U. S. & S.	.....
	Virden, Man.	Kirkella	26.6 s	54 S	U. S. & S.	.....
	Kirkella, Man.	.....	0.8 s	1 S	U. S. & S.	.....
	Bevermouth, B. C.	Connaught	17.5 s	33 S	U. S. & S.	.....
	Clanwilliam, B. C.	.....	2 s	1 S	U. S. & S.	.....
C. of G.	Various	.....	.....	.....	.....	5 F
C. R. R. N. J.	Red Bank, N. J.	Winslow Jct.	65.6 s	122 C	U. S. & S.	2 A
	Various	.....	.....	.....	.....	13 F
C. & O.	Clyffside, Ky.	West Ashland	8 d	15 C	.....	.....
	West Ashland, Ky.	Russell	3 t	12 C	.....	.....
	Various	.....	.....	.....	.....	2 A
	.....	.....	.....	.....	.....	2 F

TABLE A—AUTOMATIC SIGNALS COMPLETED IN 1925—Continued

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
N. & W.	Koonoke, Va.	Shenandoah	132 s	273 P	U. S. & S.	U. S. & S.
Penna.	Funnel No. 1, Va.	Ft. Gay	30 d	69 S	U. S. & S.	U. S. & S.
East. Reg.	Bordentown, N. J.	Trenton	4 d	6 P	U. S. & S.	U. S. & S.
Cent. Reg.	Aspinwall, Pa.	East Liberty	1.4 f	8 P	U. S. & S.	U. S. & S.
	Sarah Furnace, Pa.	M. P. 56.4	1.7 d	1 P	U. S. & S.	U. S. & S.
	Struthers, Ohio	Haselton	1.7 d	2 S	U. S. & S.	U. S. & S.
	Boanna, Ohio	Niles Jct.	1.2 d	2 S	U. S. & S.	U. S. & S.
	Girard Jct., Pa.	"G1" Bk. Sta.	1.5 d	2 S	U. S. & S.	U. S. & S.
	"SB" Leetonia, O.	"RO" Salem	8 s	2 S	U. S. & S.	U. S. & S.
	Carnegie, Pa.	Oakdale	6.5 d	14 P	U. S. & S.	U. S. & S.
	Bulgar, Pa.	Dinsmore	5.5 t	30 S	U. S. & S.	U. S. & S.
	Dennison, Ohio	Uhrichsville	1.8 d	2 S	U. S. & S.	U. S. & S.
West. Reg.	Oakdale, Pa.	Sturgeon	2 d	2 P	U. S. & S.	U. S. & S.
	Various	Sturgeon	1 s	1 P	U. S. & S.	U. S. & S.
	Mansfield, Ohio	Erie Crossing	1 s	3 P	U. S. & S.	U. S. & S.
	Dunkirk, Ohio	Erie Crossing	1 s	1 P	U. S. & S.	U. S. & S.
	Ft. Wayne, Ind.	Valparaiso	0.8 d	14 P	U. S. & S.	U. S. & S.
	Terre Haute, Ind.	"K" Bk. Sta.	0.2 d	14 P	U. S. & S.	U. S. & S.
	E. St. Louis, Ill.	Missouri Ave.	0.2 d	14 P	U. S. & S.	U. S. & S.
	"WU" Tower, O.	Cincinnati	5 d	14 P	U. S. & S.	U. S. & S.
	Various	Various	11.2 s	31 S	U. S. & S.	U. S. & S.
Reading	Newton, Pa.	Bryn Athyn	0.2 d	6 C	U. S. & S.	U. S. & S.
	Harrisburg, Pa.	Various	2.2 d	454 C	U. S. & S.	U. S. & S.
S. A. L.	Richmond, Va.	Hamlet, N. C.	235 s	51 C	G. R. S.	G. R. S.
Southern	Morristown, Tenn.	Knoxville	42 d	28 C	G. R. S.	G. R. S.
	Atlanta, Ga.	Austell	17 d	93 s	G. R. S.	G. R. S.
C. N. O. & T. P.	Williamstown, Ky.	Flat Rock	13 d	199 S	G. R. S.	G. R. S.
S. P.	Folk, Ore.	S. Salem	12.2 s	20 S	U. S. & S.	U. S. & S.
	Wilbur, Ore.	Yoncalla	15 s	24 S	U. S. & S.	U. S. & S.
	Yuma, Ariz.	Ivalon	5.1 d	16 S	U. S. & S.	U. S. & S.
	Emigrant Gap, Cal.	Andover	30 d	74 C	U. S. & S.	U. S. & S.
	San Antonio, Tex.	Seabright	2.1 s	7 C	U. S. & S.	U. S. & S.
T. & I.	San Antonio, Tex.	Yard	1.5 d	12 S	U. S. & S.	U. S. & S.
	Withers, Tex.	Hacienda	57 s	126 S	U. S. & S.	U. S. & S.
	Osman, Tex.	Sanderson	61.5 s	108 S	U. S. & S.	U. S. & S.
	Eureka, Tex.	Cypress	18.8 s	36 S	U. S. & S.	U. S. & S.
	Courtney, Tex.	Navasota	7 s	23 S	U. S. & S.	U. S. & S.
	Hearne, Tex.	Yard	1.2 s	3 S	U. S. & S.	U. S. & S.
	Harvey, La.	Avondale	8 s	20 S	U. S. & S.	U. S. & S.
	Hot Wells, Tex.	Sierra Blanca	25.6 s	61 S	U. S. & S.	U. S. & S.
	Semmes Jct., Tex.	Yard	0.5 s	1 S	U. S. & S.	U. S. & S.
	Austin, Tex.	Yard	1 s	2 S	U. S. & S.	U. S. & S.
T. R. R. A. St. L.	St. Louis, Mo.	Valley Jct.	1 s	1 S	G. R. S.	G. R. S.
U. P.	Madison, Ill.	Valley Jct.	2 s	2 S	G. R. S.	G. R. S.
L. A. & S. L.	Salt Lake, Utah.	Caliente, Nev.	27.8 s	66 S	U. S. & S.	U. S. & S.
O. S. L.	Riverside, Cal.	Los Angeles	2.6 s	8 S	U. S. & S.	U. S. & S.
	Orchard, Ida.	Perkins Jct.	2.6 s	12 S	U. S. & S.	U. S. & S.
	Nampa Loop Jct., Ida.	Main Line Jct.	1.6 s	3 S	U. S. & S.	U. S. & S.
O. W. R. R. & N.	Various	Various	1.5 s	3 S	U. S. & S.	U. S. & S.
St. J. & G. I.	No. River Jct., Wash.	Various	1.5 s	3 S	U. S. & S.	U. S. & S.
Wabash	Decatur, Ill.	Bement	2 s	3 S	U. S. & S.	U. S. & S.
	Huntington, Ind.	Various	4 s	8 C	U. S. & S.	U. S. & S.
	Wabash, Ind.	Various	5 s	7 C	U. S. & S.	U. S. & S.
	Logansport, Ind.	Peru	13 s	17 S	U. S. & S.	U. S. & S.

TABLE B—AUTOMATIC SIGNALS UNDER CONSTRUCTION, JANUARY 1, 1926

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
A. T. & S. F.	Fallbrook Jct., Cal.	Escandido Jct.	31.1 s	6 C	U. S. & S.	U. S. & S.
	Angiola, Cal.	Shirley	31.1 s	54 S	U. S. & S.	U. S. & S.
A. C. L.	Java, S. C.	Lanes	46.1 d	90 S	U. S. & S.	U. S. & S.
	Drayton Hall, S. C.	Yemassee	49.4 d	100 S	U. S. & S.	U. S. & S.
	Burroughs, Ga.	Doctortown	37.6 d	77 S	U. S. & S.	U. S. & S.
B. & O.	Waverly, Md.	Mt. Royal	2 d	8 CP	Hall	U. S. & S.
	Camden, Md.	Bailey	0.7 d	10 CP	Hall	U. S. & S.
	New Castle Jct., Pa.	Akron Jct., Ohio	71 d	132 CP	Hall	U. S. & S.
	Sterling, Ohio	Greenwich	35 d	54 CP	Hall	U. S. & S.
	St. George, S. I.	Arlington, S. I.	5.1 d	30 CP	Hall	U. S. & S.
	Various	Various	54.7 d	148 S	Hall	U. S. & S.
C. B. & O.	Charlton, Ia.	Ottumwa	24.7 s	68 C	G. R. S.	U. S. & S.
C. G. W.	Various	Various	5 d	40 C	U. S. & S.	U. S. & S.
C. R. I. & F.	Chicago, 25th st.	61st st.	3 s	6 C	U. S. & S.	U. S. & S.
	White City, Kan.	Doubling Spur	12 d	6 S	U. S. & S.	U. S. & S.
L. V.	Various	Various	13.5 s	281 S	G. R. S.	G. R. S.
L. & N.	Mobile, Ala.	Gentilly, La.	4.5 d	19 S	G. R. S.	G. R. S.
M. P.	Edlah, Mo.	Hermann	4.9 d	...	...	...
	Gasconade, Mo.	Isbell	18.8 d	...	...	...
	Osage, Mo.	Moreau River	3.6 d	...	...	...
	Poplar Bluff, Mo.	Hoxie, Ark.	55.5 s	...	...	...
	Hoxie, Ark.	Bald Knob	56.5 s	...	...	...
	Little Rock, Ark.	Ensign	6.5 d	...	...	...
	Benton, Ark.	Clear Lake Jct.	112 s	...	...	...
N. C. & St. L.	Atlanta, Ga.	Chattanooga, Tenn.	87 s	180 C	U. S. & S.	U. S. & S.
N. Y. C.	Churchville Jct., N. Y.	Buffalo	54 d	102 C	Hall	U. S. & S.
	Various	Various	96.4 s	44 S	G. R. S.	G. R. S.
C. C. C. & St. L. Waver.	Ind.	Pana, Ill.	1.5 d	106 C	...	...
M. C.	Various	Various	9 d	18 S	G. R. S.	G. R. S.
N. Y. N. H. & H.	Sharon Hts., Mass.	Readville	3.3 d	11 S	U. S. & S.	U. S. & S.
	Helronville, Mass.	Attleboro	1.7 d	...	...	...
	Lebanon, N. Y.	Manamora	80 d	192 P	U. S. & S.	U. S. & S.
Penna.	Lemoyne, Pa.	Mt. Vernon, Md.	4.2 d	4 S	U. S. & S.	U. S. & S.
Cent. Reg.	Cross Cut, Pa.	Edenburgh	6.1 s	2 P	U. S. & S.	U. S. & S.
West. Reg.	Tiffin, Ohio	Various	6.2 d	...	...	...
	Various	Various	...	...	...	...

s—Single track. d—Double track. t—Three track. A—Autoflag crossing signal. F—Flasher light crossing signal. S—Semaphore. C—Color-light. P—Position-light. CP—Color-position light.

73 combination color-position light signals were installed on the Baltimore & Ohio.

The construction of highway crossing protection is included in our annual statistics for the first time this year. A total of 935 automatic highway crossing protection signals were reported as installed during 1925, of which 329 were of the movable banner autoflag type and 606 of the flashing-light type. The Baltimore & Ohio reports the installation of 212 flashing-light highway crossing signals, and the Reading is next with 105 such signals. The Chicago & North Western installed 80 of the autoflag type and the Atchison, Topeka & Santa Fe 47.

Block Signaling Under Construction

As the year 1925 closed, 1,208 miles of single track and 579 miles of double-track signaling were under construction. The majority of this mileage is in the southern half of the United States where construction work can be continued through the colder months. The Southern Railway System, including the C. N. O. & T. P., has a total of 359 miles of signaling under construction on single track and 42 miles on double track. The Missouri Pacific has signaling under way on 167 miles of single track and 47 miles of double track, while the Louisville & Nashville has work under way on 134 miles on single track. The Southern Pacific is working on 211 miles of single track automatic signaling.

Interlocking Construction in 1925

Ninety-two new interlocking plants, as listed in Table C, were placed in service during 1925, of which 4 were in Canada and 89 in the United States. In addition to these new plants, extensive additions were made to 17 interlocking plants, while 76 other plants were entirely rebuilt and overhauled, adding either new machines or

extensive outside construction, changing from semaphore signals to light signals and adding electric locking in many cases. A 90-lever electro-pneumatic plant was placed in service by the Interborough Rapid Transit at 148th Street, New York City, and 65 levers of electro-pneumatic interlocking were placed in service at the Chicago Union Station. The largest electric plant reported was on the Chicago & North Western, including a 45-lever machine. Twenty-eight of the new interlocking plants placed in service during the year are mechanical, 9 electrical, 8 electro-pneumatic, 26 electro-mechanical 5 automatic, and 13 remote control layouts for the handling of passing track and junction switches. The levers in these new machines together with the levers added to plants that were rebuilt make a total of 1,530 levers which are divided into 390 mechanical, 480 electric, and 297 electro-pneumatic lever; in the electro-mechanical plants there were a total of 330 mechanical levers and 360 electric levers.

Remote Control Installed Extensively

The increased demand of operating officers to eliminate train stops at the entrance to passing tracks and outlying junctions is evidenced by the fact that during 1925 there were installed 76 levers of the desk-lever type in conjunction with 35 remote control switch machines. Typical of such an installation is that at Shelby, Mont., on the Great Northern, where the operator handles the switches for the end of double track, the junction of a branch line and the two ends of a crossover, all from his desk. A similar installation on the Burlington handles a junction switch located eight miles from the point of control.

One road equipped a layout with three remote control switch machines at a cost of \$6,000 and by actual check made a saving of \$1,920.60 in three months. By installing three desk levers and one remote control switch machine at Bordentown, N. J., the Pennsylvania combined the operation of two interlocking plants and abandoned a seven-lever mechanical machine. At Runyon, N. J., seven table lever units were installed and one remote control switch machine was installed, resulting in two block stations being combined and an eight-lever mechanical machine being abandoned. Thus it may be seen that there is an opportunity through the use of electro-mechanical interlocking plants, table lever units and remote control switch machines, to extend the limits of interlocking plants, thereby facilitating train movements at outlying junctions or passing tracks without increasing the number of levermen employed.

Automatic Interlockings for Railroad Crossings

The idea of providing automatic interlockings in the form of automatic signals for the protection of railroad grade crossings on light traffic lines, has been given consideration on numerous roads during the past year. Since the Signal Section of the A. R. A. recommended the abandonment of derails in March, 1924, several state commissions and the Board of Railway Commissioners of Canada have given the idea of automatic interlocking consideration and have approved installations.

Automatic interlockings of this type without the use of derails have been installed at three locations on the Canadian National lines during 1925 and at four locations on the Great Northern. The Great Northern also intends to remove from service mechanical interlocking plants at several crossings where levermen are now required, and to replace this equipment with automatic protection. A saving of approximately \$5,000 annually can be made at each location where this change is practicable.

TABLE B—AUTOMATIC SIGNALS UNDER CONSTRUCTION, JAN. 1, 1926—Continued

Road	From—	To—	Miles of road	Number of signals	Main factor	Highway crossing signals
Reading	Various					10 F
Sou.	Baltimore, N. C.	Morristown, Tenn.	82 s	185 C	G. R. S.	
	Roe Jct., Tenn.	New Line	7 d		G. R. S.	
	Roe Jct., Tenn.	New Line	3 s	4 C	G. R. S.	
C. N. O. & T. P.	Flat Rock, Ky.	Chattanooga, Tenn.	71 s	223 S	G. R. S.	
			35 d		G. R. S.	
A. C. S.	Chattanooga, Tenn.	Meridian, Miss.	197 s	115 S	G. R. S.	
				182 S	G. R. S.	
S. P.	Grass Lake, Cal.	Klamath Falls, Ore.	60.9 s	128 C	U. S. S.	
	Klamath Falls, Ore.	Oakridge	150.7 s	24 S	U. S. S.	
	Home, Ariz.	Yellon	18 d	36 S	U. S. S.	
Tex. & La.	Sherman, Tex.	Yard	2 s	16 S	U. S. S.	
	Miller, Tex.	Yard	0.8 s	3 S	U. S. S.	
	Dorr Jct., Tex.	Nacogdoches	0.5 s	3 S	U. S. S.	
T. & P.	Garrett, Tex.	Yard	23 s	38 C	U. S. S.	
	Marshall, Tex.	Longview Jct.			U. S. S.	
Wab.	Franklin, Ohio	Ennis, Mich.	13 d	21 C	U. S. S.	
	Danville, Ill.	Tilton	4 d	8 S	U. S. S.	
	Knights, Ill.	Roody	6 d	2 C	U. S. S.	
	Salisbury, Mo.		3 s	2 S	U. S. S.	
Totals			1,208.8 s	1,706 S		13 A
			581 d	838 C		198 F
				249 P		
				234 CP		

s—Single track. d—Double track. t—Three track. A—Autoflag crossing signal. F—Flasher light crossing signal. S—Semaphore. C—Color-light. P—Position-light. CP—Color-position light.

TABLE C—AUTOMATIC SIGNALS CONTEMPLATED FOR 1926

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
A. T. & S. F.	Lawrence, Kan.	Spencer	18.6 s	28 S	U. S. & S.	S.
	Pauline, Kan.	Emporia Jct.	53.7 s	74 S	U. S. & S.	S.
	Carrollton Jct., Mo.	Hardin	{ 16.7 s } { 33.4 d }	20 S	U. S. & S.	S.
	Burton, Kan.	Hutchinson	13.9 s	16 S	U. S. & S.	S.
	Offerle, Kan.	Wright	20.1 s	30 S	U. S. & S.	S.
	La Junta, Colo.	Trinidad	81.1 s	147 S	U. S. & S.	S.
	Abajo, N. M.	Isleta	11.1 s	17 S	U. S. & S.	S.
	Meridian, Tex.	Temple	62.4 s	100 S	U. S. & S.	S.
	Dalies, N. M.	Belen	10.2 s	13 C	U. S. & S.	S.
	Defiance, N. M.	State Line	13.4 d	15 C	U. S. & S.	S.
	Angola, Cal.	Jastro	50.2 s	85 S	U. S. & S.	S.
	San Bernardino, Cal.	Colton	3 d	6 C	U. S. & S.	S.
B. & O.	Attica, Ohio	Deshler	54.4 d	87 CP	Hall	
	Defiance, Ohio	Milford Jct.	78.2 d	127 CP	Hall	
C. N.	River du Loup, P. Q.	Yards	.....	1 S	.....	1 F
C. G. W.	Des Moines, Ia.	.....	.....	.....	.....	.....
D. T. & I.	Detroit, Mich.	Flat Rock	15 d	28 CP	.....	.....
Erie	Salamanca, N. Y.	Cuba Jct.	29 d	61 C	.....	.....
G. N.	Lurgan, N. D.	Minot	268.4 s	466 C	C. R. S. & S.	.....
N. Y. C. & St. L.	Arcadia, Ohio	Conneaut	117	.....	.....	21 F
N. C. & St. L.	Nashville, Tenn.	Chattanooga	{ 114 s } { 37 d }	320 C	.....	.....
N. Y. N. H. & H.	Danbury, Conn.	Shelton	36.5 d	50 S	.....	.....
	Attleboro, Mass.	Sharon Hts.	12.4 d	22 S	.....	.....
C. N. E.	Holmes, N. Y.	Danbury, Conn.	17.3 d	30 S	.....	.....
N. Y. O. & W.	Jewel, N. Y.	.....	.....	.....	.....	2 F
	Ferris, N. Y.	.....	.....	.....	.....	2 F
N. & W.	Vera, Ohio	Clare	96 s	228 P	U. S. & S.	.....
	Georgetown, W. Va.	Clift	4 s	11 P	U. S. & S.	.....
Penna. Cen. Reg.	Summitville, Ohio	Yellow Creek	17.2 d	32 P	U. S. & S.	.....
	Yellow Creek, Ohio	Dry Run	10.1 d	24 P	U. S. & S.	.....
	Dry Run, Ohio	Rochester, Pa.	15.3 d	30 P	U. S. & S.	.....
	Wampum Jct., Pa.	Mosier, Ohio	27.3 d	40 S	U. S. & S.	.....
	Homewood Jct., Pa.	Wampum Jct.	7.1 s	8 S	U. S. & S.	.....
	Oakdale, Pa.	Uhrichsville, Ohio	51.3 d	119 F	.....	.....
	.....	.....	36 f	.....	.....	.....
Rutland	Norwood, N. Y.	Malone Jct.	36.9 s	6 S	.....	.....
S. P.	Deetz, Cal.	Grass Lake	24 s	46 C	U. S. & S.	.....
	Oakridge, Ore.	Natron	33.6 s	79 S	U. S. & S.	.....
	Wellton, Ariz.	Pichaco	212 s	425 S	U. S. & S.	.....
	Emigrant Gap, Cal.	Andover	.....	60 C	U. S. & S.	.....
Tex. & La.	Cline, Tex.	Del Rio	55 s	120 S	U. S. & S.	.....
	Sanderson, Tex.	Marfa	103 s	185 S	U. S. & S.	.....
	Marfa, Tex.	Mexia	51 s	116 S	U. S. & S.	.....
	Metzger, Tex.	I. & P. Jct.	3 s	8 S	U. S. & S.	.....
U. P.	Echo, Utah	Gateway	25.8 d	50 S	U. S. & S.	.....
	Denver, Colo.	Union	88.2 s	176 S	U. S. & S.	.....
	Sand Creek, Colo.	La Salle	45.2 s	.....	.....	.....
L. A. & S. L.	Various	.....	.....	.....	.....	15 A
	Millford, Utah	Thomas	71 s	140 C	U. S. & S.	.....
	Carrier, Nev.	Las Vegas	59 s	108 C	U. S. & S.	.....
	Riverside, Cal.	Los Angeles	.....	.....	.....	24 A
Wab.	Montpelier, Ohio	Franklin	12 d	14 C	U. S. & S.	.....
	N. Liberty, Ind.	Lakeville	7 s	8 S	U. S. & S.	.....

TABLE C—AUTOMATIC SIGNALS CONTEMPLATED FOR 1926—Continued

Road	From—	To—	Miles of road	Number of signals	Manu- facturer	Highway crossing signals
	Feru, Ind.	Huntington	27 s	26 C	U. S. & S.	.....
	Bement, Ill.	Lodge	12 d	14 C	U. S. & S.	.....
	Bement, Ill.	Tolono	17 d	20 C	U. S. & S.	.....
	Boody, Ill.	Taylorville	26 d	30 C	U. S. & S.	.....
	Litchfield, Ill.	Mt. Olive	9 d	12 S	U. S. & S.	.....
	St. Louis, Mo.	Ferguson	4 s	6 S	U. S. & S.	.....
	Moberly, Mo.	Huntsville	5 d	8 S	U. S. & S.	.....
	Carrollton, Mo.	Hardin	21 s	15 S	U. S. & S.	.....
Totals	.....	.....	1,720 s	1,882 S	.....	39 A
	.....	.....	670 d	1,339 C	.....	56 F
	.....	.....	30 f	444 F	.....	.....
	.....	.....	.....	242 CP	.....	.....

s—Single track. d—Double track. t—Three track. A—Autoflag crossing signal. F—Flasher light crossing signal. S—Semaphore. C—Color-light. P—Position-light. CP—Color-position light.

TABLE D—NEW INTERLOCKING PLANTS INSTALLED IN 1925

Road	Location of plant	Mechanical	Working levers			Remote control switch
			Electro-mech.	Electro-mech.	Electro-mech.	
A. T. & S. F.	Pauls Valley, Okla.	.....	.....	6	4	.....
A. C. L.	Yemassee, S. C.	.....	.....	.....	.....	8
C. N.	Lake City, S. C.	4	.....	.....	.....	.....
Cen. Reg.	Hastings, Ont.	5	.....	.....	.....	.....
	Eastern Junction, P. Q.	9	.....	.....	.....	.....
	St. Augustine, P. Q.	.....	.....	.....	.....	.....
Wes. Reg.	Edmonton, Alta.	.....	.....	.....	.....	.....
C. P.	Virden, Man.	.....	.....	.....	.....	3 2
C. of N. J.	Bloombury, N. J.	.....	.....	.....	.....	3
C. & O.	Russell, Ky.	.....	.....	.....	.....	.....
	West Ashland, Ky.	.....	.....	.....	.....	.....
	Clydeside, Ky.	.....	.....	.....	.....	.....
	Buffalo Tunnel, Ky.	.....	.....	.....	.....	.....
	Covington, "BS," Va.	4	.....	.....	.....	.....
	Balcony Falls, Va.	.....	.....	4	5	.....
	Kenova, W. Va.	2	.....	.....	.....	2 1
C. B. & O.	E. Winona, Wis.	5	.....	.....	.....	.....
	Cobb Jct., Neb.	.....	8	.....	.....	.....
	Shannon, Ia.	.....	.....	.....	.....	3 3
Chi. U. Sta.	Chicago	.....	.....	.....	.....	.....
D. & H.	Troy, N. Y.	.....	.....	.....	.....	5
D. L. & W.	East End of Binghamton Yd., N. Y.	.....	.....	.....	.....	.....
D. T. & I.	Sibley, Mich.	.....	.....	.....	.....	.....
G. N.	Alouez Yd., Wis.	7	.....	.....	.....	.....
	Emmert Jct., Minn.	.....	.....	.....	.....	.....
	Pacific Jct., Mont.	.....	.....	.....	.....	.....
	Shelby, Mont.	.....	.....	.....	.....	.....
	Snowden, Mont.	.....	.....	.....	.....	.....
	Fairview, Mont.	.....	.....	.....	.....	.....
	Bowbells, N. D.	.....	.....	.....	.....	.....
	Manley, Minn.	.....	.....	.....	.....	.....
	Paynesville, Minn.	.....	.....	.....	.....	.....

TABLE E—NEW INTERLOCKING PLANTS UNDER CONSTRUCTION JANUARY 1, 1926

Road	Location of plant	Working levers				Remote control switch machines	
		Mechanical	Electro-pneumatic	Electro-mech.	Elect.	Desk lever	machines
A. T. & S. F.	Marceline, Mo.	..	..	..	..	4	2
	Turner, Kan.	..	..	..	..	..	..
	Belleville, Tex.	..	..	..	..	2	1
	Fort Worth, Tex.	..	..	..	..	..	..
A. C. L.	Darrow, Ga.	6	..	..	..	..	..
	Lanes, S. C.	..	..	..	..	4	..
	Rocky Mount, N. C.	4	..	..	..	..	..
B. & L. E.	Branchton, Pa.	..	..	23	9	..	..
C. of G.	Fort Valley, Ga.	..	..	..	..	6	3
C. of N. J.	Newark Bay Dr., N. J.	..	38	..	..	..	..
C. & O.	Gauley, W. Va.	..	..	20	5	..	..
	Clifton Forge, Va.	..	..	4	2	..	..
	Clifton Forge, Va.	..	24	..	..	2	..
C. & N. W.	California Jet, Ia.	..	..	..	..	3	..
C. R. I. & P.	Doubling Spur, Kan.	10	..	..	..	..	..
Erie	Paterson, N. J.	..	..	..	..	..	1
I. C.	Markham Yard, Ill.	..	257	..	..	..	..
	Northbound Yard, Ill.	..	..	..	..	..	..
	Markham Yard, Ill.	..	..	..	..	..	..
	Southbound Yard, Ill.	..	..	..	..	..	..
	E. St. Louis, Ill.	..	170	..	..	..	..
	E. St. Louis, Ill.	..	108	..	..	..	..
L. G. N.	Austin, Tex.	12	..	..	..	..	..
M. K. T.	Nevada, Mo.	..	..	..	..	..	..
N. Y. C.	Nasby, O.	..	..	..	..	..	..
	Suspension Bridge, N. Y.	..	80	..	..	..	..
	C. C. C. & St. L., Fenox, O.	..	131	..	..	..	..
	N. Y. C. & St. L., South Whitley, Ind.	..	..	16	7	..	..
	N. Y. C. & St. L., E. Hartford, Conn.	..	..	..	..	..	..
	N. Y. N. H. & H., Hartford, Conn.	..	..	..	..	..	..
	Mamaroneck, N. Y.	..	12	..	..	..	..
P. & E.	York, Pa.	..	18	..	..	..	..
Reg.	New Brighton, Pa.	..	..	12	16	..	2
Cen. Reg.	Rochester, Pa.	..	29	..	..	..	1
	Monongahela City, Pa.	..	..	9	15	..	..
Reading	Birdsboro, Pa.	..	31	..	..	..	..
S. P.	Redding, Calif.	..	..	..	..	2	..
	Pacific Jet, Calif.	..	..	..	..	..	..
T. & L. lines	Dallas, Tex.	..	..	..	..	..	..
	Rosenberg, Tex.	..	..	..	..	2	1
	Eagle Lake, Tex.	..	..	..	..	2	1
Wab.	Gary, Ind.	..	..	..	..	1	1
Totals		88	758	368	74	54	13

TABLE D—NEW INTERLOCKING PLANTS INSTALLED IN 1925—Continued

Road	Location of plant	Working levers				Remote control switch machines	
		Mechanical	Electro-pneumatic	Electro-mech.	Elect.	Desk lever	machines
K. C. S.	Cedar Grove, La.	10	..	..	..	..	..
L. & N.	Dolen, Ky.	..	..	4	4	..	..
	Perritt, Ky.	..	..	4	7	..	..
	Harrell, Ky.	..	..	4	7	..	..
	Rigolets, La.	..	..	4	2	..	..
	Nashville, Ill.	19	..	..	..	..	..
	Chef Menteur, La.	..	..	3	2	..	..
	Easton, Tenn.	7	..	..	..	..	..
I. R. T.	New York, 204th St.	..	52	..	..	..	..
M. S. P. & S. S. M.	Fond du Lac, Wis.	6	..	..	..	..	..
M. P.	Eureka, Mo.	6	..	10	..	..	1
	Bucyrus, Kan.	6	..	10	..	..	2
	Wagstaff, Kan.	10	..	10	..	..	2
	John Brown, Kan.	7	..	8	..	..	1
	Alcoa, Mo.	8	..	12	..	..	2
	Dorison, Mo.	25	..	4	..	..	2
	Bald Knob, Ark.	..	..	..	..	1	1
N. Y. C. & St. L.	Maple Grove, O.	..	..	25	12	..	..
	Bluffton, O.	10	..	..	..	..	..
N. Y. C.	Palatine, N. Y.	..	..	21	24	..	..
	Stuyvesant, N. Y.	..	..	7	13	..	..
	Nat. Jet, N. Y.	..	..	12	20	..	..
	Schradak Jet, N. Y.	..	..	9	13	..	..
	Voorheesville, N. Y.	..	..	..	..	..	..
	Buffalo, N. Y.	..	..	..	..	..	..
	Buffalo, N. Y.	..	144	..	..	..	..
C. C. C. & St. L.	Mix, O.	..	..	..	..	..	..
N. Y. N. H. & H.	India Point, R. I.	12	..	..	..	..	..
	Putnam, Conn.	24	..	..	..	..	..
N. & W.	Kermit, W. Va.	..	..	..	..	4	..
	Loch Laird, Va.	..	..	..	..	10	..
	Glasgow, Va.	..	..	..	..	8	..
	Tunnel No. 4, W. Va.	..	..	..	..	2	..
Penna. Cen. Reg.	Pittsburgh, Pa.	..	17	13	13	..	..
	"CQ" Stock Yds., Pa.	..	..	14	16	..	1
Wes. Reg.	Bradford, O.	..	..	17	8	..	..
	Clare, O.	..	..	..	..	..	..
	Cincinnati, "O.A." O.	..	..	..	..	..	..
	Marion, Ind.	..	21	18	8	..	..
	Burgoon, O.	..	..	8	8	..	..
	Maple Grove, O.	..	..	24	22	..	..
Reading	Harrisburg, Pa.	..	27	..	..	..	..
S. L. S. F.	Baxter Springs, Kan.	17	..	..	..	..	..
S. P.	Ivalon, Ariz.	..	..	..	..	2	1
T. & L. lines	San Antonio, Tex.	..	..	..	..	..	..
	Port Arthur, Tex.	11	..	..	..	..	..
	Baer Jet, Tex.	..	..	..	..	2	1
	Harvey Canal, La.	3	..	..	..	..	..
	Company Canal, La.	3	..	..	..	..	..
T. & P.	Denton, Tex.	3	..	..	..	..	..
	Jefferson, Tex.	3	..	..	..	..	..
	So. Mansfield, La.	9	..	..	..	..	..
U. P.	Ellsworth, Kan.	5	..	..	..	..	..
Totals		230	45	269	183	111	65
							23

Good Prospects for 1926

At least 22 roads have definitely decided on their signaling programs for 1926, as shown in Table-C. Signaling is to be provided on 1,720 miles of single track and 670 miles of double track, these figures being 505 miles and 270 miles respectively larger than at this time last year. In addition one road is known to have authorized the installation of signals on 366 miles of line and another carrier is reasonably sure of a 25-mile installation. Therefore, it may be expected that at least 3,000 miles of road will be equipped with automatic signals during 1926, which will be a record for the past 12 years.

Fifty-four interlocking plants are planned for 1925. The Wabash is to install a 48-lever mechanical plant, the Union Pacific a 75-lever electric plant, and the Central Railroad of New Jersey a 43-lever electro-pneumatic plant. In addition to the new plants listed in Table-F involving 1,002 levers of interlockings, 21 plants are to be rebuilt, bringing the total levers contemplated to 1,236 levers. Forty-three desk levers and 50 remote control switch machines are to be installed in 1926. As no decision or announcement has yet been made of the 1926 budgets on many roads, numerous other installations will be included in the 1926 program and practically all the roads, with the exception of the anthracite carriers, report prospects bright for expenditures to be approved; therefore the signal and interlocking installations for 1926 should show a decided increase even over 1925.

Three Unique Developments in 1925

The outstanding development of the year is the car retarder system for the control of cars in gravity classification yards, so that car-riders are not required. The patent

rights of the original system developed on the Indiana Harbor Belt Line at Gibson, Ind., were taken over by the two large signal companies one of which continued the development along the line of the original installation, using electric control with pneumatic operation while the other has developed an all-electric system. The Illinois Central is equipping three humps with the car retarder system and it is expected that these will be in service within a few months. A number of other roads have investigated the possible use of such a system and report a total of 32 yards in which installations are being considered.

A unique development in signaling made recently is the operation of passing track switches under the control of an engineman in the cab of an approaching locomotive. Such a system was installed at one location on a steam road and has been in successful operation with a limited number of locomotives for a short time. Standardized signaling apparatus is used and in view of the fact that all train movements are made with signal protection there is no evident reason why an extensive installation would not be practicable.

Some roads have hesitated to install light signals on territory where commercial power was not available on account of the increased power consumption in comparison with semaphore signals. Within the last few years more efficient lens combinations and a so-called reflecting mirror have been developed and during 1925 this mirror was installed on a large installation on the Great Northern. Satisfactory indications are secured with a 5-watt lamp which reduces the power required to within limits that may be supplied economically by local battery supply.

The elimination of wayside permissive automatic sig-

TABLE F—NEW INTERLOCKING PLANTS CONTEMPLATED FOR 1926

Road	Location of plant	Working levers				Remote control switch machines	
		Mechanical	Electric	Electro-pneumatic	Electro-mech. Mech. Elec.	Desk lever machines	
A. T. & S. F.	Sugarland, Tex.	..	..	..	4	2	..
	Arcola, Tex.	..	..	..	4	2	..
	Ballinger, Tex.	..	..	..	4	2	..
	Tuscola, Tex.	..	..	..	4	2	..
	Clifton, Tex.	..	..	..	..	..	2
C. of N. J.	East Penn Jet., Pa.	..	..	43	..	..	..
D. L. & W.	Kingsland, N. J.	13	..	..	..	..	..
D. T. & I.	Carleton, Mich.	..	20	..	..	..	..
G. N.	Surrey, N. D.	..	7	..	..	..	..
	Minot, N. D.	..	1	..	..	1	..
I. C.	7th St., Chicago	..	..	..	..	..	..
K. C. S.	Mulberry, Mo.	10	..	..	..	..	..
	Richards, Mo.	20	..	..	..	..	..
	Gulfton, Mo.	20	..	..	..	..	..
L. V.	Easton, Pa.	..	60	..	..	..	..
	Athens, Pa.	..	19	..	..	..	..
	So. Wilkes-Barre, Pa.	..	..	..	..	3	..
L. & N.	Three Mile Creek, Ala.	..	..	..	3	..	..
	Baxter, Ky.	..	..	..	4	..	..
	Industrial Canal, La.	..	15	..	..	..	..
N. Y. C. & A.	Springfield, Mass.	..	185	..	..	..	..
	Beaver Falls, Pa.	..	40	..	..	..	..
	East Roscoe, Pa.	..	16	..	..	..	..
N. Y. C. & St. L.	So. Wabash, Ind.	16	..	..	..	..	..
N. P.	Mullerry St., Minneapolis	..	..	..	..	..	..
P. Cent. Reg.	Wheeler, O.	..	..	..	8	6	..
	Hudson, O.	..	..	..	8	7	..
	Trafford, Pa.	..	..	..	..	..	..
	St. Marys, Pa.	..	..	..	..	4	..
	Keating, Pa.	..	5	..	..	..	1
S. L. S. F.	Pleasanton, Kan.	17	..	..	..	..	3
S. P.	Wellton, Ariz.	..	..	..	..	..	..
	Mescal, Ariz.	..	..	..	..	9	..
T. & L. lines	Summit, Calif.	..	38	..	..	14	..
	Houston, Tex.	..	35	..	..	..	4
	Metzger, Tex.	..	45	..	..	..	..
	Pierce Jet., Tex.	12	..	..	..	..	..
U. P.	Summit, Neb.	..	30	..	..	..	..
	Bonner Springs, Kan.	..	18	..	..	..	..
	Topeka, Kan.	..	75	..	..	..	..
L. A. & S. L.	Long Beach, Calif.	..	6	..	..	..	..
Wab.	N. Kansas City, Mo.	..	15	..	..	..	..
	Ashburn, Ill.	..	48	..	..	..	..
	Galatin, Mo.	..	..	..	..	..	..
	Chapin, Ill.	..	..	..	..	..	..
	Golden, Ill.	..	..	..	..	..	..
	Conception, Mo.	..	..	..	..	..	1
Totals	..	156	639	43	39	30	37
	..	..	..	..	..	..	11

nals, using cab signals in the locomotives on continuous train control territory, was employed first on the A. T. & S. F. on which road an installation was placed in service on 104 miles of double track on January 1, 1925. The Illinois Central made a similar installation and removed the wayside automatic permissive signals that were in service.

Several roads report favorable consideration of this idea but are reluctant to abandon the use of the wayside

anical life of many types of signal equipment cannot be secured before they become obsolete and in some cases the newer equipment shows such decided economies of operation that the old apparatus can be replaced with a saving.

For example the New York Central Lines have replaced the lower quadrant semaphore gas type signals with color-light signals on 54 miles of four track road between Cleveland, Ohio, and Ashtabula, and intends to continue this change eastward from Ashtabula to Buffalo, N. Y., in 1926. Likewise, the Chicago, Burlington & Quincy, long an advocate of the two-position lower quadrant semaphore signal, has replaced these semaphores with three-color-light signals on its 37-mile three-track line between Chicago and Aurora, Ill.

Several roads have increased the capacity of certain stretches of multiple track by providing duplex signaling for the protection of train movements in either direction on each track.

As an illustration, the New York Central Lines have such an installation leading into the Grand Central terminal which allows the maximum number of tracks to be used in the direction of the preponderance of traffic at different periods of the day. Other roads are using duplex signaling on busy sections of multiple track which permits stretches of idle track to be utilized by routing fast trains around slower moving tonnage trains. On the Illinois Central, the Chesapeake & Ohio, and the Chicago, Burlington & Quincy the center track of a three-track section is signaled both ways while on portions of the Illinois Central System and the Louisville & Nashville Railroad both tracks of a double track section are signaled for direction.

TOTAL CONSTRUCTION, 17 YEARS, I. C. C. REPORTS

Year	Miles of road		Net addition to miles of road operated by block system
	Construction of automatic block	Construction of manual block	
1908	1,387.6	-517.6	870.0
1909	2,047.1	4,162.2	6,209.3
1910	3,473.8	2,037.3	5,511.1
1911	2,623.4	2,517.2	5,140.6
1912	1,883.9	5,656.2	7,540.1
1913	4,350.5	-1,563.4	2,787.1
1914	3,294.2	6,577.5	9,871.7
1915	1,079.0	-1,112.0	-33.0
1916	2,012.1	-179.8	1,832.3
1917	2,238.5	-1,114.7	1,123.8
1918	1,796.3	-1,430.3	366.0
1919	979.4	1,007.1	1,986.5
1920	575.1	-575.7	-0.6
1921	517.6	66.5	584.1
1922	1,004.1	-328.0	676.1
1923	1,471.5	1,282.0	2,753.5
1924	2,302.0	112.0	2,190.0
*1925	2,641.0	75.0	2,726.0

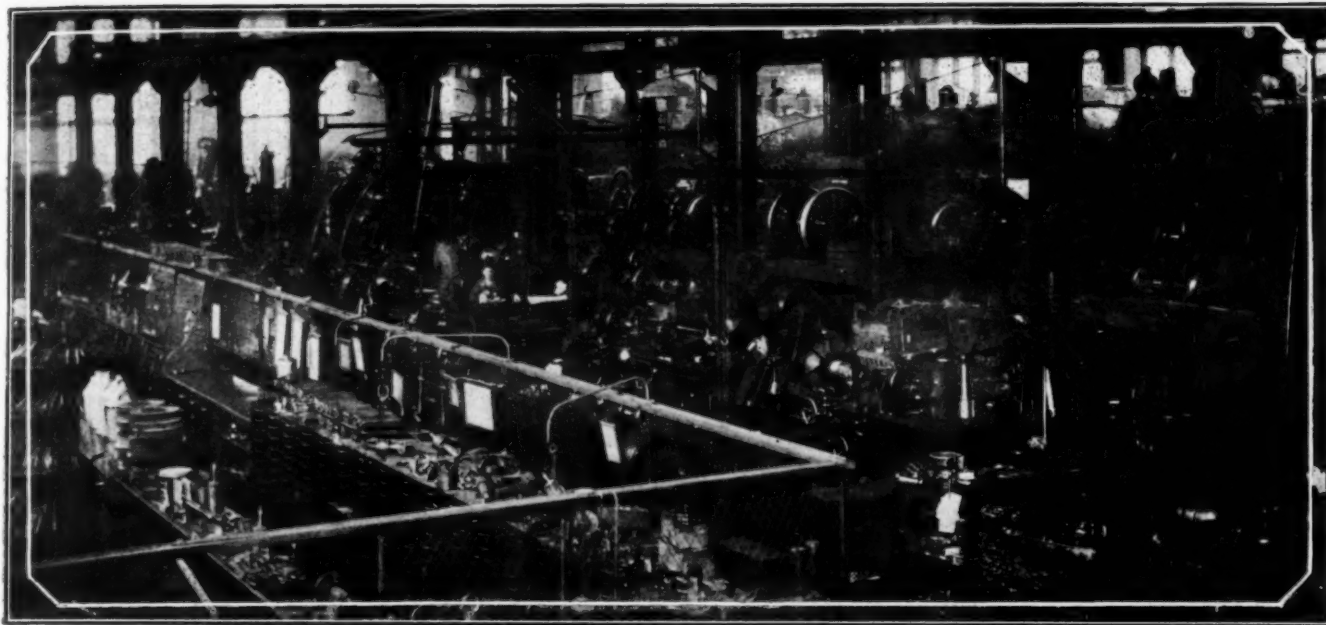
*Figures for 1925 are ours.

signals until train control and cab signals are more fully developed.

Signaling is developing so rapidly that the full mech-



An Electrified Line in the Bavarian Mountains



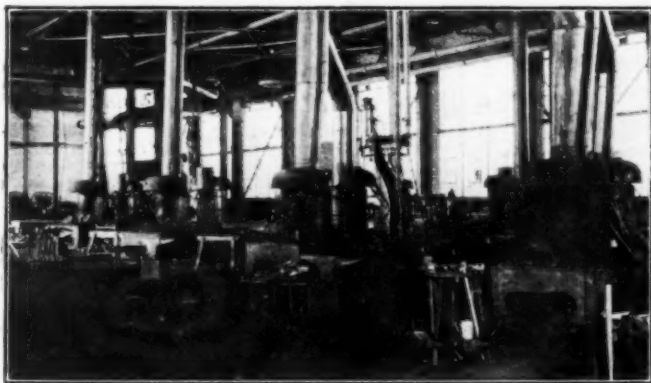
Machine Tools Purchased During 1925

Little difference in the amount of shop equipment purchased last year as compared with 1924

By L. R. Gurley

LAST year's Statistical Number of the *Railway Age* contained, for the first time, a tabulation of machine tools purchased by 85 railroads in North America, which represented 77 per cent of the total route mileage on this continent. The lists of tools furnished by these roads were complete. They indicated the extent to which the railways were buying tools and the types of

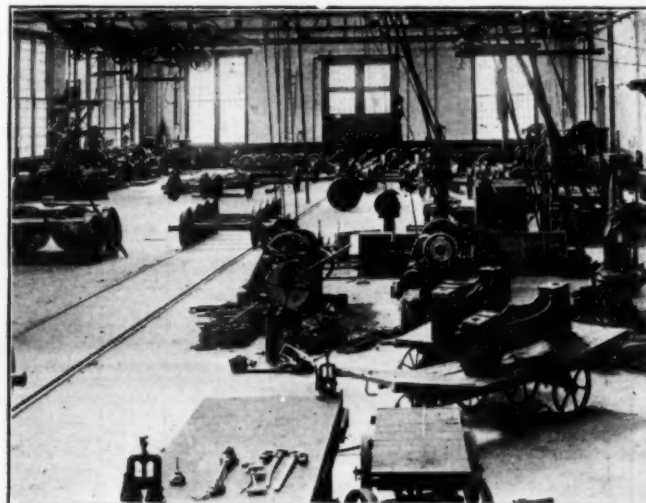
machinery, punches, shears, riveters, presses, etc., and car shop woodworking machines, as well as the metal cutting machines commonly classed as machine tools, but also to include material handling equipment, such as shop trucks, overhead cranes, car and locomotive hoists, and small



A Forge Shop for Handling Small Work

tools more generally used in railway shops. Through the co-operation of the railroads in furnishing the data, it is now possible to publish the machine tools purchased during another year.

The list of the various types of machine tools purchased has been enlarged to include not only blacksmith, boiler and car shop metal working or forming machinery, such as bulldozers, bolt machines, steam hammers, flue welding



A Car Department Machine Shop

shop hoists, together with furnaces, motors, generating sets, air compressors and welding equipment.

The tables shown herewith contain the list of machine tools and shop equipment furnished by 88 railroads in the United States and Canada which represents 77 per cent

Purchaser	Lathes				Drill Presses		Planers	Shapers	Slotters	Boring Mills		Milling Machines		Grinding Machines			Metal Cutting Saws	Portable Boring Tools and Others	Bolt Cutters and Threaders	Pipe Cutters and Threaders	Presses		Hammers		Forging Machines		Punches	Shears	Combination Punch and Shear
	Axle	Engine	Turret	Wheel	Radial	Vertical and Others				Horizontal	Vertical and Others	Universal	Horizontal and Others	Cylindrical	Internal	Surface					Double End, Tool and Others	Wheel	Others	Steam	Other Power	Buildozers				Others
Ann Arbor					1										1														
Alton & Southern						1									1														
Alabama, Tennessee, Northern		1																											
Atchison, Topeka & Santa Fe	2	6			1	4		3	1		2				6	1	5	2		2	1			1					
Atlanta & West Point																				5								1	
Atlantic City															1														
Atlantic Coast Line		10	1		3	1		2			2	2	1	2	2	1		3		1				1	2	1			
Baltimore & Ohio	1	4			1	2		4			2	2		2	11	2	5			1									
Bangor & Aroostook																2													
Boston & Albany	1	4	1		1		2			1	1				2	1	1	1									1		
Bessemer & Lake Erie										No Report Received																			
Boston & Maine	3		1					1			1	1	1	1	3	3	4	3	1		1	3							
Buffalo, Rochester & Pittsburgh																													
Canadian National																													
Canadian Pacific			2	1			2	1	2						4	4		1		2					1	2			
Central of Georgia	1	4	1	1	1						1			1	5		1	3									1		
Central of New Jersey	1		1	1							2			1	2	1	1			1									
Chesapeake & Ohio	1	2		1	6		1	1	1	1				5	1	2	1	1		2	1				1	2			
Chicago, Burlington & Quincy	5	3				9		1					2	1	4	4	3		1		1		1	1	2	2			
Chicago & Eastern Illinois	1														1		1												
Chicago, Indianapolis & Louisville															1		1												
Chicago & North Western																													
Chicago, Milwaukee & St. Paul	2	8	2	3	7	5	1	5			3				8	2	1	1	3						1	1	5		
Chicago River & Indiana															1	1													
Chicago, Rock Island & Gulf																													
Chicago, Rock Island & Pacific	2	2			2	1				1			1		8		1	1	3						1	1			

[illegible]

of the total route mileage. Using the 1924 list of machine tools purchased as a basis of comparison, the number of tools reported purchased this year is only 35 units or two per cent less than those reported for 1924. This fact indicates that railway purchases of machine tools are not affected by the same conditions which affected in so marked a degree the car and locomotive market during the past year.

Comparison of Types Purchased

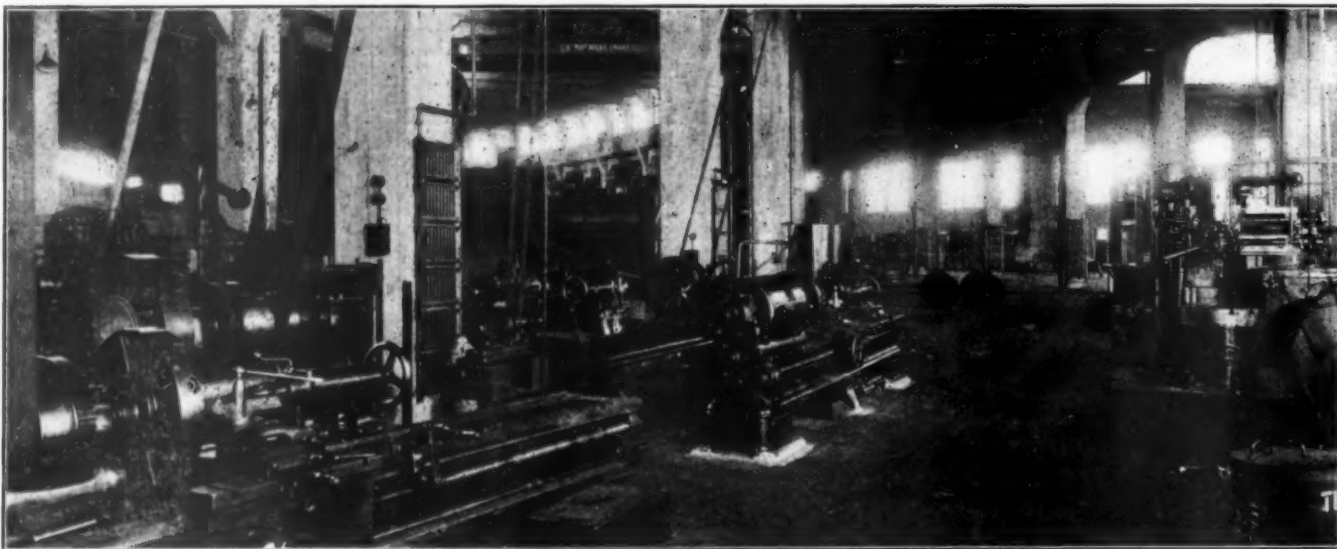
Even though the available data covers a period of only two years, what may ultimately prove to be some interesting trends are beginning to appear. The tables show that the lathe, particularly the engine type, is by far the most widely used machine in the railroad shop. Although there were 31 less engine lathes purchased this year than last, the purchase of axle and wheel lathes has increased over that of last year by 12 and 23, respectively. The purchase of milling machines has decreased slightly, while that of grinding machines has increased considerably. The purchase of internal grinders has increased from 20 to 36.

Such standard railway shop tools as the drill press,

"other presses", includes 24 bushing presses, 5 driving box presses, 2 portable crank pin presses, and 10 spring forming presses. Various miscellaneous types of tin shop, flue shop and carpenter shop machinery were also included in the lists furnished by the railroads, but these are not shown because of the difficulty of classifying them.

Material Handling Equipment

The large number of material handling devices and other shop equipment listed for the first time this year indicates a marked tendency to provide railway shops with up-to-date labor-saving facilities, as well as with the necessary machine tools. It is interesting to note that 14 car and locomotive hoists were purchased as compared to 23 overhead cranes which handle the same equipment. There were purchased also 230 air, electric and chain hoists, used for lifting car and locomotive parts. The railroads have been somewhat slow in replacing hand trucks with power trucks for hauling material. That this situation is now being improved, however, is evidenced by the fact that 114 electric trucks and 16 gasoline trucks were purchased last year, together with 85 trailers for use with the power trucks.



Modern Machine Tools are Necessary for the Economical Operation of an Engine Terminal

shaper, planer and boring mill were purchased this year in practically the same number as last year. There was a considerable increase in the purchase of steam hammers; 34 were bought this year as compared to 19 last year. There was a 50 per cent increase in the purchase of combination punches and shears. Such an increase might be expected from the fact that this is a double purpose tool which saves floor space, as well as investment as compared with separate tools for each purpose.

Included under the column headed "miscellaneous drill presses" are 28 sensitive and 9 centering drill presses; under "miscellaneous boring mills" are 14 car wheel and 3 driving box boring mills, and under "portable machine tools" are 21 cylinder boring bars, 11 cylinder and dome facing machines, 11 crank pin turning machines, 7 cylinder facing machines and 6 valve seat facing machines. The column headed "other grinding machines", which includes 232 various smaller types of grinders, also includes 37 double end, 18 twist drill, 11 tool, 15 universal and 13 chaser grinders, as well as such types as saw blade, valve, knife, cock, bench and electric car wheel grinders. This list is indicative of the extent to which grinding processes are employed in railway shops. The column headed

Furnaces and blowers, such as are used in the boiler shop, flue shop or blacksmith shop, are another important addition to this year's tabulation. In the column headed "other furnaces" are included 17 plate furnaces and 29 electric rivet furnaces, as well as such equipment as tempering, brass, gas, hammer and forging furnaces. In the column headed "blowers" are 26 pressure blowers, 14 soot blowers, 31 forge blowers and 11 ventilating fans, as well as several unclassified.

The railroads bought 24 air brake test racks last year. Fifty-four air compressors of various types were also purchased for shop use.

The railroads were requested to furnish a list of the electric and gas welding equipment purchased. The lists showed the purchase of 110 electric welders. Two complete acetylene gas generating sets were also included. As these plants, however, are frequently not owned by the railroads where they are installed, others may have been placed in service during the year, under leasing arrangements. Much small gas welding equipment, such as torches, regulators, gages, etc., was listed, but owing to the lack of space, it is impossible to include it in the tables.



Canadian National Articulated Car Driven by a 340-hp. Diesel-Electric Power Plant

Orders for Automotive Equipment

*Increase in number and size of rail motor cars ordered—
Buses a new feature*

By C. W. Foss and C. B. Peck

THE number of automotive vehicles ordered by the steam railways—whether for use on their own rails or on the highways—became sufficiently large in 1925 to require the *Railway Age* to show the details of such orders in a separate article. The importance of

case of the buses, only two roads are reported as having placed sizable orders. One of these is the New York, New Haven & Hartford, which ordered 91 for use by its highway subsidiary, the New England Transportation Company, and the other is the Boston & Maine, which ordered 29 for use by the Boston & Maine Transportation Company. Neither of these companies has been operating buses for an extended period of time. The Boston & Maine began bus operations on a large scale only as recently as May, and the New Haven did not begin until

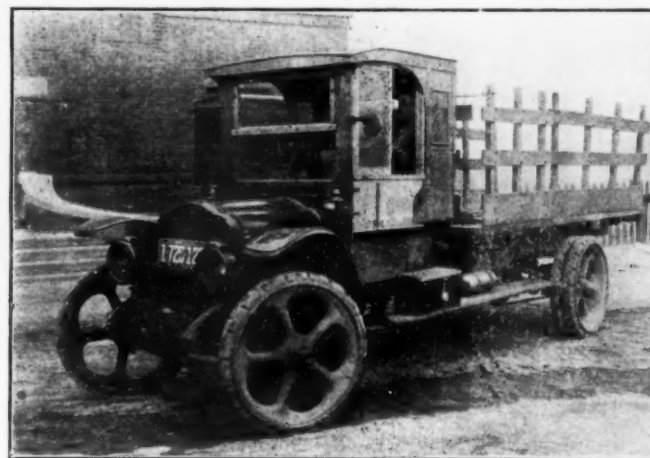


In Service on the Long Island

this feature of railway purchases has, in short, become such as no longer to permit the inclusion of this equipment in a subordinated position in the regular annual article on purchases of standard passenger train car equipment.

The automotive vehicle for use by the railways made its first appearance in the *Railway Age* tabulations for 1922 in the form of the rail-motor car. The total reported for that year was 51 cars. In 1923, the railways ordered 76 such cars; in 1924, the number increased to 120, and for 1925 the lists show a total of 149.

In the lists of orders for this year, there is also another innovation, a tabulation of the railway orders for automotive vehicles for use on the highway—namely, buses and trucks.* In neither case is the number large. In the



In Use by the New York Central at Mott Haven Yard, New York

September. The New Haven's subsidiary, the New England Transportation Company, was described in the *Railway Age* of December 5 as then operating bus routes totaling 184 miles. It has since received certificates of public convenience and necessity in Connecticut for the operation of an additional 228 route miles.

Another railway which is operating a great number of

buses is the Great Northern, whose subsidiary, the Northland Transportation Company, the parent company of an extensive system of bus operating companies, has some 140 buses in service, principally in Minnesota. These buses do not appear in the lists of orders in 1925, however, because the Great Northern did not buy buses but



A Truck in Heavy Service

instead purchased the interests of bus operating companies already in the field. The Reading seems at the moment to be the next company likely to embark in bus operations on a large scale. There are now pending before the Pennsylvania Public Service Commission that company's applications for certificates covering the operation of bus routes in Schuylkill County. The Reading management has contended that if bus operations are to be undertaken,

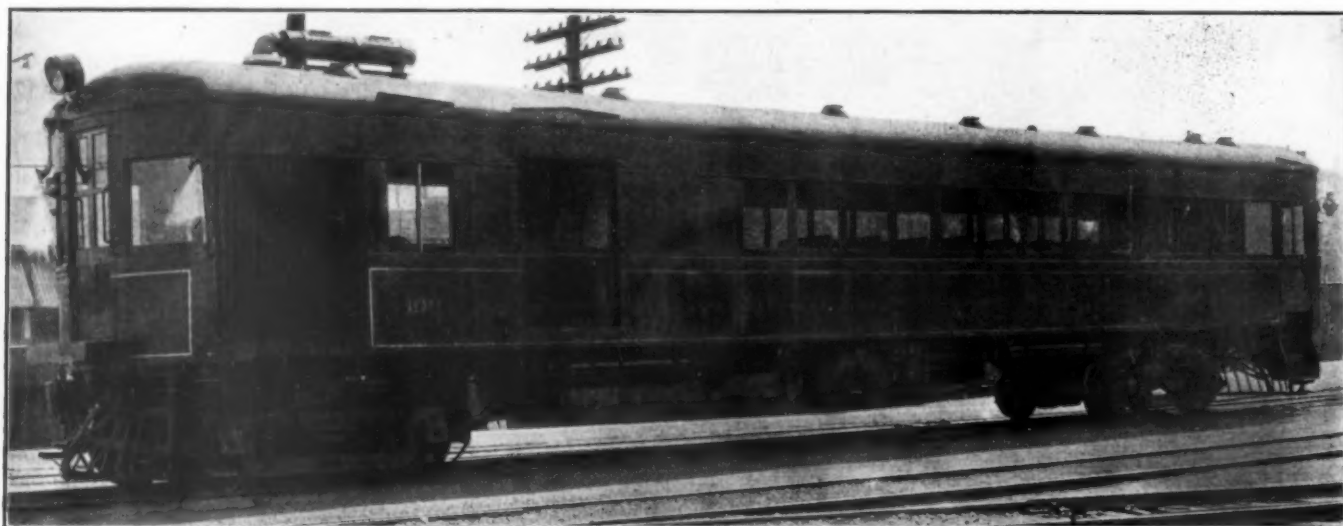
supply their own trucks. The automobile companies who sell the trucks are finding that they best secure success in railway sales not so much in selling trucks to the railroads but in interesting them to contract for the handling of their l. c. l. freight by truck instead of by rail.

Rail Motor Coaches Ordered in 1925

The continually increasing number of railway motor cars ordered each year since their introduction following the return of the railways to private control indicates a steady growth of business in the rail-car field. This is all the more striking because there was a slight decline in the number of passenger cars ordered for operation with steam locomotives.

The fact of outstanding interest in connection with the 1925 business was the marked trend toward more powerful and heavier units and the extent to which electric transmission is being incorporated in the power plants of these larger and heavier units. The gasoline-propelled passenger car had its commercial inception through the desire of the motor truck industry to find an outlet for its production capacity during a period of extremely poor business following the close of the European war. The adaptation of the standard motor truck chassis to rail operation immediately directed the attention of the railroads to the possibilities of the application of the gasoline motor to railway cars, but the demand was almost immediate for units of larger capacity than the truck manufacturers cared to furnish. The "child" very quickly outgrew its parental home, and during the intervening years has established itself as an industry in which constantly less and less of the automotive, and more and more of the standard railway practice has become evident.

Among the outstanding developments in design which have been embodied in the orders during 1925, may be



Brill Gas-Electric Car with 250-hp. Motor Embodying Double-End Control

the Reading is the logical interest to operate them—because of the possibility of co-ordinating rail and motor transport, because of the railway company's management skill and sense of public responsibility, and because of its already well-established position in transportation.

The orders for highway trucks include only those placed by railways for their own uses. The list unfortunately is not complete even for such orders. The large market for motor trucks to be used in railway service such as, notably, the handling of l. c. l. freight or for store door delivery, does not seem to be the railways themselves. This service is usually contracted for and the contractors

mentioned the double-end control which is quite general where electric transmission is used, and which has even been worked out to the point that multiple unit control is available should there be any demand for the operation of trains including more than one motor car. Another development of outstanding interest is the application of the Diesel engine to a number of cars on the Canadian National and the application in two of these of the articulated principle with a 340-hp. motor. The design of these motors in themselves is of more than ordinary interest because of the high crank shaft speed and the unusually light weight per horsepower which was attained in them.

Orders for Gasoline, Gas-Electric or Storage Battery Rail Motor Cars

For Service in the United States

Purchaser	No.	Motor or trailer	Type of power plant	Class	Horse-power	Seating Capacity	Weight	Builder
Alaska R. R.	1	Motor	Gasoline	.....	190	50	54,000	J. G. Brill Co.
Baltimore & Ohio	1	Motor	Gasoline	Pass., Bagg. & Mail	190	31	65,200	J. G. Brill Co.
	1	Motor	Gasoline	Pass. & Bagg.	190	67	56,480	J. G. Brill Co.
	1	Trailer	.....	.....	...	52	42,860	Company Shops
Boston & Maine	3	Motor	Gas-Electric	.....	175	54	78,600	Electro-Motive Co.
	2	Motor	Gas-Electric	.....	250	52	76,000	J. G. Brill Co.
	1	Motor	Gas-Electric	.....	250	100	90,000	J. G. Brill Co.
	4	Motor	Gasoline	.....	150	47	53,100	J. G. Brill Co.
	2	Motor	Gasoline	.....	150	32	53,100	J. G. Brill Co.
	2	Trailer	.....	.....	...	74	42,000	J. G. Brill Co.
	2	Trailer	.....	.....	...	50	42,000	J. G. Brill Co.
	1	Trailer	.....	.....	...	94	52,000	J. G. Brill Co.
Butler County	1	Motor	Gasoline	.....	104	40	50,000	Edwards
Butte, Anaconda & Pacific	1	Motor	Gasoline	.....	40	...	12,000	Edwards
Calif. West. R. R. & Nav. Co.	1	Motor	Gasoline	.....	80	45	20,000	Mack Motor Car Co.
Chicago & Alton	1	Motor	Gas-Electric	.....	185	44	72,000	Electro-Motive Co.
	2	Motor	Gas-Electric	.....	185	19	72,000	Electro-Motive Co.
	2	Motor	Gasoline	Pass. & Bagg.	208	40	75,000	Railway Motors Corp.
Chicago & Northwestern	2	Motor	Gasoline	.....	2-104	38	79,300	Railway Motors Corp.
	1	Motor	Gas-Electric	.....	200	54	76,000	Electro-Motive Co.
Chicago, Burlington & Quincy	6	Motor	Gasoline	Pass., Bagg. & Mail	200	30	69,000	Edwards
	4	Motor	Gasoline	Pass. & Bagg.	200	42	42,000	Edwards
Cincinnati Northern	4	Motor	Gas-Electric	Bagg. & Mail	210	...	83,000	Electro-Motive Co.
Clev., Cinn., Chic. & St. Louis	1	Motor	Gasoline	Bagg. & Mail	190	...	53,000	J. G. Brill Co.
Colorado & Southern	1	Motor	Gasoline	.....	200	50	43,000	Edwards
Columbus & Greenville	1	Motor	Gasoline	.....	190	50	54,000	J. G. Brill Co.
	1	Trailer	.....	.....	190	60	42,000	J. G. Brill Co.
Delaware & Northern	1	Motor	Gasoline	.....	190	23	56,000	J. G. Brill Co.
Detroit, Toledo & Ironton	2	Motor	Gas-Electric	.....	300	44	.....	Pullman
Erie	2	Motor	Gasoline	.....	175	50	53,000	J. G. Brill Co.
	2	Motor	Gas-Electric	.....	250	50	80,000	J. G. Brill Co.
	1	Motor	Gas-Electric	.....	250	65	80,000	J. G. Brill Co.
	1	Motor	Gasoline	.....	...	38	70,000	J. G. Brill Co.
Grand Trunk Western	1	Motor	Gas-Electric	Pass., Bagg. & Mail	200	...	76,000	Electro-Motive Co.
Graysonia, Nashville & Ashdown	1	Motor	Gasoline	.....	50	43	21,000	J. G. Brill Co.
Great Northern	5	Motor	Gas-Electric	.....	175	52	70,000	Electro-Motive Co.
	1	Motor	Gasoline	.....	190	50	58,000	J. G. Brill Co.
	1	Trailer	.....	Bagg. & Mail	...	...	...	J. G. Brill Co.
	1	Motor	Gas-Electric	.....	250	50	90,000	J. G. Brill Co.
Illinois Central	4	Motor	Gasoline	.....	190	59	53,000	J. G. Brill Co.
Kansas City, Mex. & Orient	3	Motor	Gasoline	.....	190	56	53,120	J. G. Brill Co.
	2	Trailers	.....	Bagg. & Mail	...	...	42,100	J. G. Brill Co.
Lake Erie Franklin & Clarion	1	Motor	Gasoline	.....	70	38	30,000	J. G. Brill Co.
Lehigh & New England	1	Motor	Gas-Electric	.....	175	68	74,400	J. G. Brill Co.
Lehigh Valley	1	Motor	Gasoline	.....	150	56	53,000	J. G. Brill Co.
	3	Motor	Gas-Electric	.....	200	52	73,000	Electro-Motive Co.
	1	Motor	Gas-Electric	.....	200	42	73,000	Electro-Motive Co.
	1	Motor	Gas-Electric	Bagg. & Mail	200	...	73,000	Electro-Motive Co.
	1	Trailer	.....	.....	...	80	44,000	Electro-Motive Co.
Liveoak, Perry & Gulf	1	Motor	Gasoline	.....	70	40	17,000	Company Shops
Louisiana & Northwest	1	Motor	Gasoline	.....	250	53	55,000	J. G. Brill Co.
Marion & Rye Valley	1	Motor	Gasoline	.....	200	52	43,000	Edwards
Maryland & Delaware Coast	1	Motor	Gasoline	.....	125	38	30,000	J. G. Brill Co.
	1	Trailer	.....	.....	...	34	21,000	J. G. Brill Co.
Minn., Red Lake & Manitoba	1	Motor	Gasoline	Pass. & Bagg.	208	40	70,000	Railway Motors Corp.
Minn., St. Paul & S. Ste. Marie	1	Motor	Gas-Electric	.....	175	52	79,900	Electro-Motive Co.
Missouri-Kansas-Texas	1	Motor	Gas-Electric	.....	175	54	70,000	Electro-Motive Co.
Missouri Pacific	5	Motor	Gasoline	.....	225	48	59,180	Sykes
	5	Trailers	Gasoline	.....	...	...	38,000	Sykes
	2	Motor	Gasoline	.....	65	59	50,000	J. G. Brill Co.
Nevada Central	1	Motor	Gasoline	.....	60	20	12,000	Meister Co.
New Orleans Great Northern	1	Motor	Gasoline	.....	190	52	59,960	J. G. Brill Co.
New York Central	4	Motor	Gasoline	Pass. & Bagg.	190	52	57,000	J. G. Brill Co.
	2	Motor	Gasoline	Pass. & Bagg.	190	47	57,000	J. G. Brill Co.
N. Y., N. H. & Hartford	5	Motor	Gas-Electric	.....	250	90	110,000	J. G. Brill Co.
New York, Ontario & Western	1	Motor	Gas-Electric	.....	250	50	90,000	J. G. Brill Co.
	2	Motor	Gas-Electric	.....	250	90	110,000	J. G. Brill Co.
Northern Pacific	3	Motor	Gas-Electric	.....	175	57	78,600	Electro-Motive Co.
	1	Motor	Gasoline	Pass. & Bagg.	208	40	75,000	Railway Motors Corp.
Pennsylvania	4	Motor	Gasoline	.....	190	56	54,310	J. G. Brill Co.
	1	Trailer	Gasoline	.....	...	74	43,000	J. G. Brill Co.
	3	Motor	Gas-Electric	.....	250	54	90,000	J. G. Brill Co.
Pittsburg, Shawmut & Northern	1	Motor	Gasoline	.....	190	56	53,000	J. G. Brill Co.
Reading	1	Motor	M.U. Gas-Elec.	.....	250	50	88,000	West'h'se-Brill
St. Louis-San Francisco	2	Motor	Gas-Electric	.....	175	54	72,000	Electro-Motive Co.
	2	Motor	Gas-Electric	.....	175	62	62,000	Sykes
	1	Motor	Gasoline	Pass., Bagg. & Mail	208	40	70,000	Railway Motors Corp.
Seaboard Air Line	2	Motor	Gas-Electric	Pass. & Bagg.	400	34	.....	Electro-Motive Co.

Purchaser	No.	Motor or trailer	Type of power plant	Class	Horse-power	Seating Capacity	Weight	Builder
Shreveport, Alexandria & Southwestern	1	Motor	Gasoline	.....	125	30	30,000	H. J. Reith
Virginia & Carolina Southern	1	Motor	Gasoline	.....	75	30	18,000	Edwards
	1	Trailer	Gasoline	.....	...	40	15,000	Edwards
Wabash	1	Motor	Gas-Electric	Pass. & Bagg.	105	27	70,000	Electro-Motive Co.
	1	Motor	Gas-Electric	Baggage	105	...	70,000	Electro-Motive Co.
Canada								
Canadian National	4	Motor	Gasoline	.....	70	38	30,000	J. G. Brill Co.
Canadian Pacific	2	Motor	Gasoline	.....	150	43	33,300	Company Shops
Crows Nest Pass. Coal Co.	1	Motor	Gasoline	.....	200	52	43,000	Edwards
Export								
Havana Central	6	Motor	Gasoline	.....	40	51	25,000	Intern'l. Motors Co.
National Rys. of Mexico	1	Motor	Gas-Electric	.....	200	54	76,000	Electro-Motive Co.
Siam State Rys.	1	Pass. Motor	Steam	.....	...	...	.....	Baldwin Loco. Wks.
South America	1		Gasoline	.....	75	25	15,000	Edwards
South Australian Rys.	25		Gasoline	Pass. & Bagg.	190	50	54,000	J. G. Brill Co.

Railway Purchases of Highway Motor Vehicles For Service in the United States

Purchaser	No.	Bus or Truck	Model Designation	Bus Seating Capacity	Truck Capacity in Tons	Builder
Alabama, Tenn. & Northern	1	Bus	Type A-50	22-26	.....	White Co.
Boston & Maine	3	Buses	Type "H"	18	.....	Brockway Motor Co.
	4	Buses	Type 50A	25	.....	White Co.
	10	Buses	Type 50A	29	.....	White Co.
	12	Buses	Type "Y"	21	.....	Yellow Truck & Coach Mfg. Co.
Chicago, Milwaukee & St. Paul	1	Bus	.....	29	.....	Yellow Truck & Coach Mfg. Co.
Detroit & Mackinac	1	Truck	Speedwagon	.....	1½-ton	Reo Motor Co.
Long Island	1	Truck	Type 21 UF	.....	2-ton	Autocar Co.
N. Y., N. H. & Hartford	15	Buses	Safety Coach	27	.....	Fageol Co.
	6	Buses	Type 5-A H-1	27	.....	International Harvester Co.
	12	Buses	Type De Luxe	27	.....	International Motor Co.
	1	Truck	Type A. B.	.....	2-ton	International Motor Co.
	18	Buses	Type Z	27	.....	Pierce Arrow Motor Car Co.
	10	Buses	Type De Luxe	27	.....	White Co.
	30	Buses	Type Y	27	.....	Yellow Truck & Coach Mfg. Co.
	5	Pass. Cars	4 cyl. Sedan	5	.....	Chrysler
	1	Pass. Cars	6 cyl. Sedan	5	.....	Chrysler
Norfolk & Western	1	Truck	Model 45	.....	5-ton	White Co.
	1	Truck	Model 63	.....	2½-ton	International Motor Co.
	1	Truck	Model 20	.....	2-ton	White Co.
	1	Truck	Speedwagon	.....	1¾-ton	Reo Motor Car Co.
Pennsylvania	1	Truck	.....	.....	1½-ton	.....
	1	Truck	.....	.....	3½-ton	.....
	1	Bus	.....	26	.....	.....
	2	Truck	.....	.....	¾-ton	.....
	2	Truck	.....	.....	¾-ton	.....
	1	Truck	.....	.....	2½-ton	.....
	1	Truck	.....	.....	2-ton	.....
	2	Truck	.....	.....	1-ton	.....
	2	Truck	.....	.....	1½-ton	.....
	1	Truck	.....	.....	1½-ton	.....
	1	Truck	.....	.....	1½-ton	.....
	1	Truck	.....	.....	2½-ton	.....
Richmond, Fred. & Potomac	1	Truck	Model 51	.....	2½-ton	White Co.
Waco, Beau., Trinity & Sabine	1	Pass. Car	4 cyl. Sedan	5	.....	Ford Motor Co.
Waterloo, Cedar Falls & Southern	2	Buses	2½-Dual-A. B.	32	.....	International Motor Co.
Export						
International Rys. of Cen. Amer.	4	Trucks	.....	.....	1½-ton	Dodge Brothers
	2	Trucks	.....	.....	3½-ton	International Motor Co.
	1	Truck	Speedwagon	.....	.....	Reo Motor Car Co.



Baltimore & Ohio 70-Ton All-Steel Gondola Built by the Standard Steel Car Company

The Rail Market for Highway Vehicles*

Automotive expert estimates market in 1926 for 2000 to 5000 motor trucks or buses

By Edward F. Loomis

Secretary, National Motor Truck Committee National Automobile Chamber of Commerce, New York

WHAT the railroad market for motor trucks and buses will be in 1926 must at best be mere conjecture. Nevertheless the trend in rail circles toward adoption of the bus and truck as allies is sufficiently distinct to suggest that a minimum of 2,000 of these units is likely to be placed in rail service during



The Lackawanna Uses Trucks Like These to Fuel Its Ferryboats

the next 12 months. A conservative view of the maximum would be 5,000.

Although the railroads first began to adopt the motor truck as an auxiliary, the major development in rail-highway co-ordination in 1926 will be in the use of the



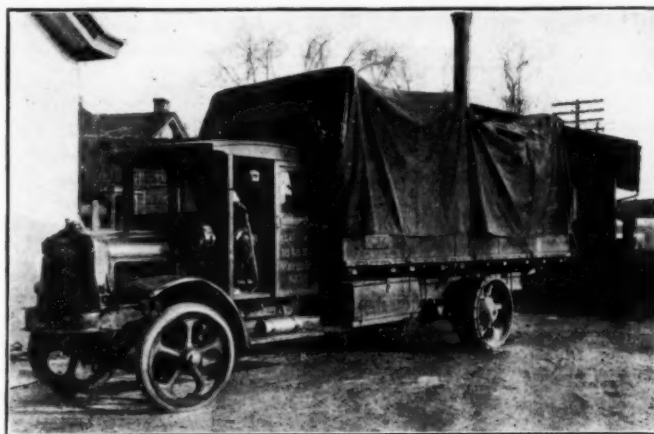
Used in Transfer Service for the Baltimore & Ohio

motor bus. Unless railroad plans for the use of trucks to avoid expensive trap car service and for store door delivery materialize more rapidly than is now anticipated, it is not likely that a maximum of 500 new trucks for use in rail service in 1926 will be exceeded.

[*The estimates in this article regarding the probable railroad market are not based upon any survey made by the *Railway Age*, but are based on a survey made in behalf of the manufacturers of motor vehicles.—EDITOR]

The bulk of the new highway development, then, will be in added motor bus service. Because of the falling off of passenger patronage due to increased use of the automobile, and because automobile owners have developed a preference for riding on rubber when not using their own cars, the problem of auxiliary bus service has thrust itself upon rail executives and is obtaining thorough attention from which rapid decisions as to policy are resulting.

The truck service problem, though first to arrive upon the scene, and although acute in some territories, cannot get the attention which it deserves in a period when freight loadings are making new records, and profits from freight handling are piling up at a rate which obscures other issues. It is not the general tendency to question seriously whether or not larger profits could have been



Scott Bros. Truck Moving L. C. L. Freight for Pennsylvania Railroad

made through radical changes during a period in which a business undertaking is making a fine record.

The Basis for 1926 Suggestions

Basis for suggestions about 1926 developments above made are found partially in the results of a survey conducted by the National Automobile Chamber of Commerce in September, 1925, into railroad use of motor vehicles, which are available for distribution upon request. The important facts thus developed are as follows:

Fifty-one railroads in the United States and Canada are now using motor trucks to supplement their shipping service.

Fifteen railroads are studying the possibilities of transporting freight by truck, contemplating either the use of trucks for the first time or the use of additional trucks.

Twenty steam railroads, or their subsidiaries, own over 219 motor buses. Most of these have begun to carry passengers on the highways within the last year.

Eighteen steam railroads not using buses are considering the installation of bus service.

One hundred ninety steam and electric railroads in the United States and Canada are using over 496 gasoline or gas-electric rail motor coaches. Twenty-six of these lines consider addi-

tional equipment of this type, and have already ordered 38 more units.

Eighteen steam and electric railroads not now having rail motor coaches are investigating their use.

These facts should be compared with the results of a similar survey, completed in September, 1924, which are as follows:

Thirty-three railroads in the United States and Canada were using motor trucks as part of their shipping service.

Twenty-one railroads contemplated, or were investigating the use of trucks for the first time, or expected to add to their trucking service.

Buses were not included in this survey, as very few railroads were then using them.

One hundred seventy-four railroads in the United States, Canada and Mexico were using approximately 483 gasoline rail motor coaches. Twenty of these lines contemplated adding to their equipment.

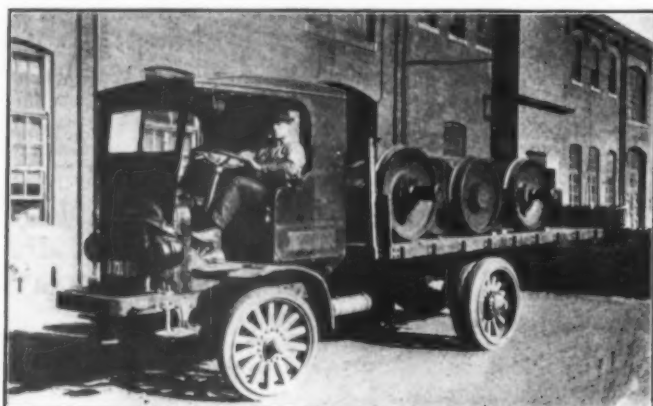
Twenty-four railroads not having gasoline rail motor coaches contemplated or were investigating their use.

The number of motor trucks in railroad use is not given in these statistics, but is known to be slightly less than 1,000. Only a handful of the trucks are directly or indirectly owned by railroads. The practice almost universally followed has been to contract with reliable trucking concerns for their use. In speaking of the probable acquisition of 500 trucks by railroads in 1926, therefore, the thought is that rail requirements of trucking contractors will be increased to that extent.

377 Buses Now in Railway Service

The 1924 survey indicated no use of buses, while the 1925 report shows a total of 20 railroads using 207 buses. Later reports indicate that this number has already been increased to 377.

Practically every railroad in this list of 20 is already gradually adding to its bus equipment. Of the 18 railroads which reported studies of bus auxiliary service, several are about to launch ambitious bus systems, and several others not included in this list, will get actively into the field on a large scale during the year, according



A Railroad Truck with a Railroad Load

to reports from both public and private sources. In fact, a number of rail lines have quietly effected working arrangements with bus lines.

5,000 in 1926 Only a Beginning

A close study of the present status of rail-highway co-ordination progress will indicate that the placing of up to 5,000 motor vehicles in rail service in 1926 will be of only minor importance as compared with the amount of such equipment in use in this field within five years. The fundamental factors which are behind this evolution are simple.

It is absolutely certain that the number of privately

owned automobiles is going to increase. As they increase, the short haul passenger traffic, now thinned out to a dangerous point, will continue to decrease. Of the potential passengers left, the motor bus will continue to take an increasing number. It will be found impossible to legislate or tax out of existence, as it has been found in the past, a public utility that enjoys the public favor enjoyed by the bus. Railroads which have passenger trains catering to short haul service, between points where thin traffic is certain, particularly during certain hours of the day, will be forced to continue curtailing this type of service. The railroad may then choose between operating bus lines or letting the patronage drift to bus lines now in existence or which will come into being.

If railroading is conceived of as the business of transporting persons and property behind steam locomotives upon steel rails, the railroad whose management takes this point of view will pare down its passenger service as demanded by the economics of the situation and forget about it. Those railroads whose managements conceive their business as providing transportation at a profit to their stockholders will get into the bus and truck field because that field is profitable and because it is closely allied with rail operation.

Bus Can Regain Lost Patronage

The bus can regain for the railroad patronage otherwise forever lost to it. It is an economical substitute for unprofitable rail service which state and national regulatory bodies will not permit to be dropped; where it cannot turn this loss into a profit, it can materially reduce the losses. Both the bus and the truck are now largely used for traffic movements starting or ending, or both, with the rail long haul, and far-sighted rail executives will appreciate the advantages, and in some cases the necessity, from a competitive point of view, of holding control over transportation mediums from which a considerable proportion of the profitable long-haul business originates.

So far as motor truck service is concerned, it is doubtful whether railroads will ever control any considerable proportion of the tonnage thus carried. It is estimated that only 10 per cent of the truck business is of the common carrier type, while 90 per cent is made up of the contract carriers, the individual owners, and the owners of fleets. Under these conditions, monopoly cannot be developed in the motor truck field, and since free competition must continue when it is so easy for the individual dissatisfied with truck service or rates to purchase and operate his own trucks, the truck cannot well and indeed has not been regulated as a monopoly. The bus, the electric railroad and the steam railroads, being common carriers without dispute, are in a different position.

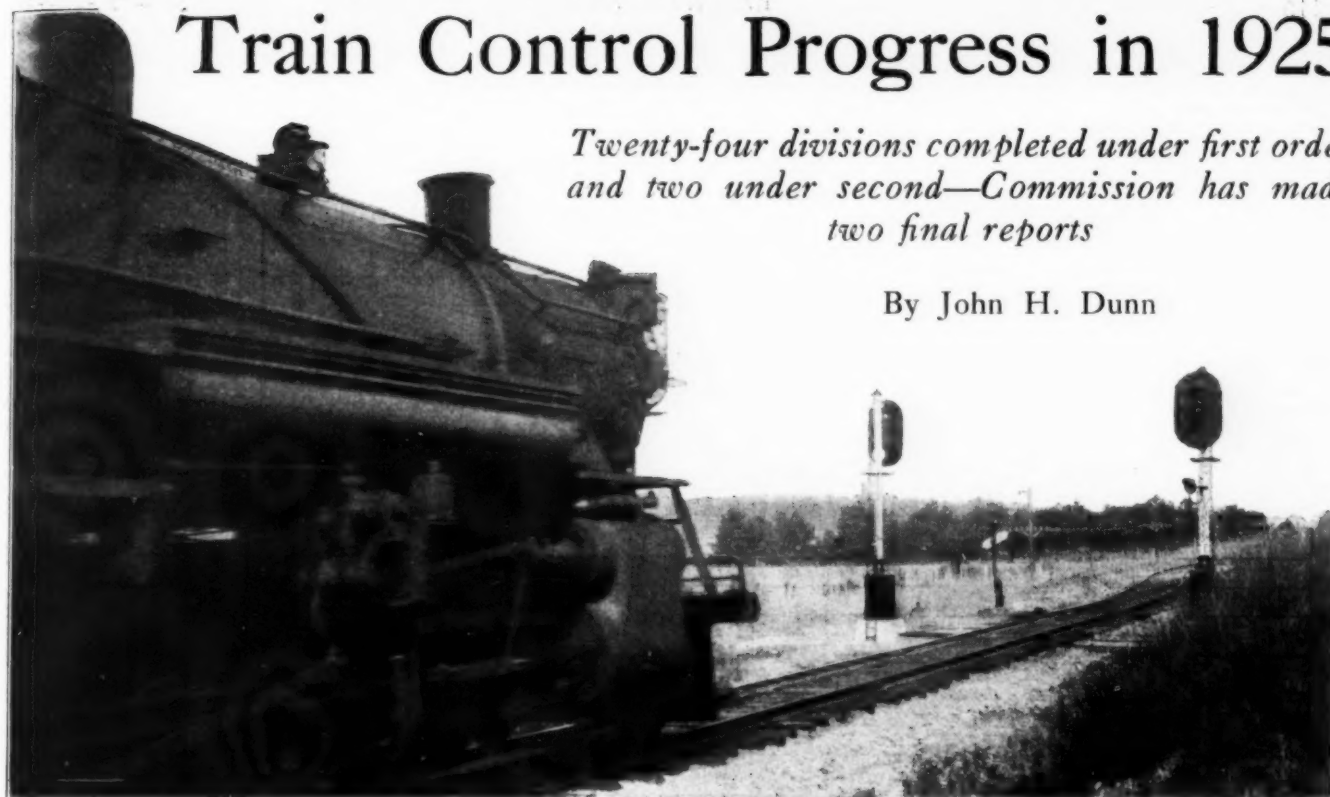
There remains in the truck field for the railroad, therefore, only the possibility of a share of the 10 per cent of common carrier operation, and such a share of the remaining 90 per cent as might be weaned from contract carriers and private carriers through demonstrated superior service or lower rates. It is to be expected that the greatest utility of the truck as a rail adjunct will be found in the transfer from rail to truck handling of short haul l.c.l. freight, of terminal interchange movement of l.c.l. freight, and of store door delivery of l.c.l. freight.

THE PUBLIC SERVICE CORPORATION, Newark, N. J., has ordered through the National Railway Appliance Company, New York, 333 gasoline-electric single-deck, 33 passenger, buses from the Yellow Truck & Coach Manufacturing Company, Chicago. These buses are to be similar in type to those now being operated by the Philadelphia Rapid Transit Company.

Train Control Progress in 1925

Twenty-four divisions completed under first order and two under second—Commission has made two final reports

By John H. Dunn



Automatic Control Insures Compliance With Indications of Wayside Signals

TWENTY-FOUR of the 45 roads on which the first train control order is now effective have reported a full engine division equipped as of January 1, 1926; two carriers also report a division complete under the second order. Although final inspection was made of nine complete division installations during the year only two final reports were issued. At the time the first order was issued on June 13, 1922, the completion date was set as January 1, 1925; but many developments in the meantime have influenced the commission in granting requests for extensions of time.

The suit of the Delaware & Hudson Company vs. the United States in the United States District Court of Southern New York resulted in decisions on several important points which affected the final completion dates. This court, in its decision of May 26, 1925, denied the Delaware & Hudson an injunction forbidding the Interstate Commerce Commission from enforcing the order requiring the installation of train control, but the court also enjoined the government from collecting penalties. The decision held, also, that the order of the commission was constitutional but pointed out that "to call the modification of the order issued on July 18, 1924, allowing the permissive feature for the train stop, a mere amendment was unfair if not absurd." The D. & H. was, therefore, granted an injunction against prosecution for two years from July 18, 1924. In other respects the petition of the railroad was denied.

Following the decisions of this court, many of the roads petitioned the commission for extensions of time, some asking until January 1, 1926, and others until July 1, 1926, and in the majority of cases the petitions were granted, especially to those carriers which had shown diligence in complying with the orders. The impracticability of meeting the original completion date was demonstrated by the fact that, aside from the three roads on which installations were made prior to the order, only

one road, i.e., the Atchison, Topeka & Santa Fe, reported a division fully equipped on January 1, 1925, the completion date mentioned in the original order.

The second order, issued on January 14, 1924, and now effective on 41 of the 45 roads included in the first order, requires that a second division be equipped with train control by February 1, 1926. The majority of the roads have not yet given much consideration to the second order, because they believe that some definite decision on their first division installation should be rendered by the commission before proceeding further. However, a few of the roads proceeded at once to their second district, notably the Southern which reported its second installation complete on November 22, 1925. The Norfolk & Western, the Santa Fe, the Union Pacific and the Chicago & North Western have second districts practically complete.

Twenty-Four Installations Now Complete

Information regarding the detailed characteristics of each installation is given in the table. The roads using the ramp type, including the Chicago & Eastern Illinois, the Chicago, Rock Island & Pacific and the Chesapeake & Ohio, made installations prior to the issuance of the train control order. The Rock Island's divisional installation of the Regan intermittent ramp type of train control was inspected in 1923. The C. & E. I. installation of the Miller intermittent ramp type, which has been in service between Chicago and Danville, Ill., since November 17, 1914, was given a final inspection starting on January 6, 1925. The Chesapeake & Ohio installation of the American ramp system installed between Gordonsville, Va., and Staunton was given a final inspection, starting on August 24, 1925. The Atchison, Topeka & Santa Fe installed a complete system of the Union Switch & Signal Company's three-speed continuous train control without wayside automatic signals, using cab signals in the locomotives. This installation was made between Chillicothe, Ill., and Shopton,

STATUS OF TRAIN STOP AND TRAIN CONTROL AS OF JANUARY 1, 1926													
Road	Order	From	To	Miles of Road	Manufacturer	Continuous or Intermittent	Train Stop or Train Control	Per Cent Wayside Complete	Locomotives		Preliminary Inspection Date	Complete Installation Date	Final Inspection Date
									To Equip	Equipped			
A.T. & S.F.	1	Chillicothe, Ill.	Shopton, Ia.	104.5 d	Union	Cont	Centr.	100	84	84		1-1-25	
A.C.L.	1	Rocky Mount, N.C.	James River Br., Va.	119 d	G.R.S.	Intr	Stop	100	61	23	3-24-25		
B. & O.	1	Baltimore, Md.	Washington, D.C.	36 d	G.R.S.	"	"		129				
B. & M.	1	Boston, Mass.	Philadelphia, Pa.	97 d	Union	Cont	Centr.	14	137	4			
C.R. & N.J.	1	Red Bank, N.J.	Winslow Jct.	05.6 s	"	"	"	100	30	30		10-25-25	
C. & O.	1	Gordonville, Va.	Staunton	51 s	Amer.	Intr	"	100	46	46		1-1-24	8-24-25
C. & A.	1	Chicago	Albion, Ill.	55 s	N.S.A.	"	Stop	35	46	10	12-1-24	7-1-26	
	2	St. Louis, Mo.	"	103 d	"	"	"		63				
C. & E.I.	1	Yard Center, Ill.	Danville	105.4 d	Miller	"	"	100	134	134		11-21-24	1-6-25
	2	Ferre Mute, Ind.	Danville, Ill.	15 s	"	"	"		21				
C. & N.W.	1	Boone, Ia.	Council Bluffs	149 d	G.R.S.	Cont	Centr.	100	101	85	6-4-25	1-1-26	
	2	"	Clinton	207 d	"	"	"	35	69		7-1-26		
C. & N. & Q.	1	Oreston, Ia.	Pacific Jct.	24 s	Sprague	Intr	Stop	100	55	55	2-3-25	8-1-25	9-22-25
	2	"	Burlington	187 d	"	"	"						
C.I. & L.	1	Hammond, Ind.	Monon	67.7 s	Sprague	"	"	30	40	6	5-4-25		
	2	No decision	"										
C.M. & St. P.	1	Bridge Switch, Minn.	Hastings	108 d	Union	Cont	"	100	67	67	9-3-25	12-15-25	
	2	LaCrosse, Wis.	Portage	101 d	"	"	"						
C.N. & I. & P.	1	Blue Island, Ill.	Rock Island	165 d	Hagan	Intr	Centr.	100	96	96		11-1-23	11-19-23
	2	Davenport, Ia.	Des Moines	110 s	"	"	"		50				
D. & H.	1	Whitehall, N.Y.	Rouses Point	108 s	G.R.S.	"	Stop	20	17	5			
	2	"	Albany	77 d	"	"	"						
D.L. & W.	1	Albany, N.Y.	East Buffalo	141 d	Union	Cont	Centr.	100	69	69	5-18-25	7-1-25	
	2	No decision	"										
Erie	1	Sparrowbush, N.Y.	Lanesboro, Pa.	162 d	G.R.S.	Intr	Stop	20	97	8			
	2	No decision	"										
G.N.	1	Minot, N.D.	Williston	98 s	Sprague	"	"	100	35	35	11-21-24	9-15-25	11-9-25
	2	Williston, N.D.	Wolf Point, Mont.	22 d	"	"	"						
I.C.	1	Champaign, Ill.	Branch Jct.	122 d	Union	Cont	"	100	54	54	3-2-25	12-31-25	
	2	Cedar Falls, Ia.	Ft. Dodge	96 s	"	"	"	100	38	38	12-31-25		
K.C.S.	1	Kansas City, Mo.	Pittsburg, Kan.	121 s	G.R.S.	Intr	"	13	16	5			
	2	Exempted	"										
L.V.	1	Boston, Pa.	Newark, N.J.	35 d	G.R.S.	"	"	100	150	14	4-2-25	4-1-26	
	2	"	Bayre, Pa.	162 d	"	"	"		175				
				17 t									
				24 f									
L.I.	1	Harold Ave., L.I.	Pt. Washington	9 s	Union	Cont	Centr.			3			
	2	Jamaica, L.I.	Babylon	12 d	"	"	"						
L. & N.	1	Corbin, Ky.	Stowah, Tenn.	162 s	Union	"	"	100	31	31	5-19-25	1-1-26	
	2	No decision	"										
Mo. & F.	1	Leeds, Mo.	Oswatimie, Kan.	50 s	N.S.A.	Intr	Stop	100	38	38	9-2-24	7-1-25	
	2	No decision	"										
N.Y.C.	1	Detroit, Mich.	Toledo, Ohio	9 d	Miller	"	"			6	6-15-25		
N.Y.C.	2	Albany, N.Y.	Syracuse	123 d	G.R.S.	"	"						
				129 f					857				
				175 s					333				
B. & A.	1	Springfield, Mass.	Rensselaer, N.Y.	65 s	"	"	"		115	130			
	2	"	Boston	98 s	"	"	"						
M.C.	1	Detroit, Mich.	Jackson	74.5 d	"	"	"				6-15-25		
	2	Wiles, Mich.	"	117 d	"	"	"						
O.C. & S.L.	1	Indianapolis, Ind.	Mattoon, Ill.	129 d	"	"	"						
	2	Mattoon, Ill.	Bridge Jct.	181 d	"	"	"						
F. & L.E.	1	Pittsburgh, Pa.	Youngtown, Ohio	13.4 d	Union	"	"		94		7-13-25		
	2	Exempted	"	53 t									
N.Y.C. & St.L.	1	Chicago	Pt. Wayne, Ind.	136 s	Union	"	"		41	6	10-22-25		
	2	No decision	"	4 d									
N.Y.N.H. & H.	1	Cedar Hill, Conn.	Springfield, Mass.	60 d	"	Cont	"	100	60	60	4-16-25	7-1-25	
	2	New Haven, Conn.	Providence, R.I.	113 s	"	"	"		178				
N. & W.	1	Shenandoah, Va.	Hagerstown, Md.	106 s	Union	"	Centr.	100	42	42	2-15-25	9-8-25	
	2	"	Roanoke, Va.	132 s	"	"	"		41				
N. & P.	1	Mandan, N.D.	Dickinson	109 s	Sprague	Intr	Stop	100	35	35	4-14-25	9-30-25	
	2	Dickinson, N.D.	Glendive, Mont.	106 s	"	"	"						
Penna.	1	Lewistown, Pa.	Baltimore, Md.	45 s	Union	Cont	Centr.	100			9-16-24		
Penna.	2	Harrisburg, Pa.	Altoona, Pa.	81.0 d	"	"	Stop	60	162	231			
				18 d									
				7 t									
				105 f									
F.C. & St.L.	1	Columbus, Ohio	Indianapolis, Ind.	53 s	"	"	"			139			
	2	Pittsburgh, Pa.	Newark, Ohio	110 d	"	"	"						
				24 t									
V.J. & S.S.	1	Camden, N.J.	Atlantic City	157 d	"	"	"		395				
	2	All in Order 1	"	58.4 d	"	"	"		146				
F.M.	1	Seymour, Mich.	Lansing	60.9 s	G.R.S.	Intr	"	100	80	6		2-1-26	
	2	Lansing, Mich.	Detroit	78 s	"	"	"						
Reading	1	Camden, N.J.	Atlantic City	54.1 d	Union	Cont	Centr.	100	52	52	1-1-25		
	2	No decision	"										
R.F. & P.	1	Alexandria, Va.	Richmond	101.6 d	"	"	"	25	66	8	6-15-25		
	2	All in Order 1	"										
St.L. & S.F.	1	Nichols, Mo.	Monett	36 s	N.S.A.	Intr	Stop	100	36	36	10-15-24	7-1-25	8-3-25
	2	No decision	"	4 d									
S.F.	1	Oakland, Cal.	Tracy	50 s	N.S.A.	"	"	100	73	73	8-4-24	1-1-25	7-30-25
	2	Tracy, Cal.	Fresno	24 d	"	"	"		75	48			
				125 s									
G.N. & S.A.	1	Rosenberg, Tex.	Glidden	50.6 s	"	"	"	100	40	40	1-1-25	7-13-25	
	2	San Antonio, Tex.	"	123 s	"	"	"		30				
Southern	1	Spencer, N.C.	Greenville, S.C.	153 d	G.R.S.	"	"	100	61	61	11-22-25		
	2	Greenville, S.C.	Atlanta, Ga.	151 d	"	"	"	100	38	38	12-22-25		
C.N. & T.M.	1	Ludlow, Ky.	Somersett	78 s	"	"	"	50	96	43	3-2-25	1-1-26	
	2	Somersett, Ky.	Chattanooga, Tenn.	88 d	"	"	"		69	22		2-1-26	
				90 d									
U.P.	1	Sidney, Neb.	Cheyenne, Wyo.	102 d	Union	Cont	Centr.	100	95	95	4-1-25	10-7-25	
	2	"	North Platte	124 d	"	"	"	100			2-1-26		
				124 d									
G.V. & N. & M.	1	Portland, Ore.	The Dalles	81.5 d	"	"	"	100	33	33	3-31-25	3-24-25	
	2	Exempted	"	2.5 d									

Legends: s - single track, d - double, t - three, f - four, Intr - Intermittent, Cont - Continuous, Centr. - Train Control, and Stop - Train Stop. The first entry opposite the name of a road applies to installation required under the first I.C.C. order and second entry to second order.

Iowa, and an extension of this installation eastward from Chillicothe to Corwith, Ill., constituting the second district, is now nearly complete. Among the other roads using the same three-speed continuous system is the Norfolk & Western which installed it, together with a complete new installation of a.c. position-light signals on 105 miles of single track between Hagerstown, Md., and Shenandoah, Va., as the first district, and has now extended this same type of installation to Roanoke, Va., as the second district. The Reading installation of the same train control system was placed in service on January 1, 1925, and that on the Central Railroad of New Jersey on October 25, 1925.

The two-speed continuous system has been adopted by several roads, of which the Oregon-Washington Railroad & Navigation was the first to receive a final inspection. This installation of the Union Company's two-speed continuous system was completed on March 1, 1925. The Union Pacific completed a similar installation on double track on April 1, 1925, while the Delaware, Lackawanna & Western's installation of this same system was completed on July 1, 1925. The Louisville & Nashville has finished its installation, while the Richmond, Fredericksburg & Potomac and the Boston & Maine have only about 21 miles equipped.

The Chicago & North Western has in service the two-speed continuous system of train control manufactured by the General Railway Signal Company on 149 miles of double track, with 122 locomotives, between Boone, Iowa, and Council Bluffs. This installation is being extended eastward from Boone, Iowa, to Clinton, as the second district.

The installations discussed so far include either the three-speed or the two-speed apparatus. The primary function of the two-speed system is to limit the speed to a minimum practical operating speed in the occupied block, which may be entered without stopping the train, provided the engineman acknowledges. The control may also be arranged to stop the train if a fixed maximum speed is exceeded. In addition to the functions of the two-speed system the three-speed system limits the speed to a medium rate in the caution block. According to the specifications of the I. C. C. order, either of these systems is classed under *train control*.

The *train stop* system includes no apparatus to regulate the speed, and until the commission modified its order on July 18, 1924, to allow the use of the permissive feature for this system, many roads had considered the *train stop* as impracticable for railroad service on busy lines; however, after this change a number of roads adopted *train stops*.

Five carriers are using the intermittent magnetic inductive train stop system of the National Safety Appliance Company. The Southern Pacific has 50 miles of single track and 24 miles of double track equipped between Oakland, Cal., and Tracy, and is extending this installation from Tracy to Fresno, Cal., for the second division. The Galveston, Harrisburg & San Antonio, also a Southern Pacific line, has a 50-mile installation and the St. Louis-San Francisco, 40 miles. Final inspections have been made of these three installations, but no report has yet been rendered. These installations are all in automatic signal territory and employ the permissive feature. The Missouri Pacific has used the same train stop system as an adjunct to its controlled-manual block signal system on 56 miles of single track between Kansas City, Mo., and Osawatomie, Kan., where trains are being operated by signal indication without written train orders. The system is so arranged that the train must come to a stop to release the brakes to pass a stop signal. The Chicago & Alton is also using the National system and has about 90 per cent of its territory of 102 miles from Chicago

to Bloomington, Ill., equipped. This road has decided to extend this installation to St. Louis, 153 miles, as its second division.

The intermittent magnetic inductive train stop system of the Sprague Safety Control & Signal Corporation is being used by four roads. The Chicago, Burlington & Quincy installation was completed on July 1, 1925, and inspected in September, while that on the Great Northern has been completed and was inspected, starting on November 9. The Northern Pacific installation was completed on September 30, 1925, and the Monon has its installation about 50 per cent finished on 68 miles of single track from Hammond, Ind., to Monon.

Thirteen roads have adopted the intermittent magnetic auto-manual train stop system of the General Railway Signal Company. The Cincinnati, New Orleans & Texas Pacific, and the Southern have installations in service, while the Lehigh Valley, the Atlantic Coast Line and the Pere Marquette have been actively engaged in installing this system and have the wayside equipment completed. A unique feature of the A. C. L. installation is the use of acknowledging levers on both the engineman's and fireman's sides of the cab, the purpose of which is to prevent the habitual or sub-conscious use of the release to pass stop or caution signals.

In August the New York Central Lines decided to adopt the intermittent inductive auto-manual train stop system and contracts were let covering the divisions under both orders to the General Railway Signal Company, including the New York Central, the Boston & Albany, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis. The contract for the division under the first order on the Pittsburgh & Lake Erie was awarded to the Union Switch & Signal Company, this road having been relieved from the second order. The New York Central Lines made test installations of the Sprague intermittent train control on the New York Central, of the General continuous system on the M. C., the B. & A. and the C. C. C. & St. L., and of the Union continuous on the P. & L. E. An interim inspection was made of the test installation of the G. R. S. continuous system on the M. C., but no report was made by the commission. On all of the five roads of the New York Central Lines, revisions of wayside circuits, the placing of ties for the inductors for the intermittent system and line work are being carried on and engines are being equipped. If materials are delivered according to schedule it is expected that these installations will be completed about the middle of 1926.

The Baltimore & Ohio, after making tests of the General tapered speed control and closing contracts for the continuous train control system on 36 miles between Baltimore, Md., and Washington, D. C., later decided to install the General intermittent inductive train stop system. On this road, therefore, little progress has been made so far, with the exception of work on the wayside equipment.

The New York, Chicago & St. Louis adopted the intermittent inductive auto-manual system of the Union Switch & Signal Company and expects to complete its first division from Chicago to Ft. Wayne, Ind., about July 1, 1926.

The Union Switch & Signal Company is supplying its continuous train stop system to six roads. The Illinois Central is using cab signals without wayside permissive automatic signals on both installations which are reported completed as of December 31, 1925. One installation is between Champaign, Ill., and Branch Jct., and the second between Waterloo, Iowa, and Ft. Dodge. The Chicago, Milwaukee & St. Paul installation between Bridge Switch, Minn., and Hastings is nearly complete. The Pennsyl-

vania System is installing the Union continuous automatic stop with the foreteller on two divisions of the Pennsylvania, two divisions of the Pittsburgh, Cincinnati, Chicago & St. Louis and one division of the West Jersey & Sea Shore. The first division on the Pennsylvania between Harrisburg, Pa., and Baltimore, Md., is 60 per cent complete. The New York, New Haven & Hartford installation, using General equipment on 30 engines and Union on 30 engines, was placed in service on July 1, 1925.

A total of 7,769.4 miles of tracks will be equipped with train control when the first order is completed, including 1,618 miles of single track, 2,557 miles of double track, 85.5 miles of three track, 183.9 miles of four track and 8.8 miles of five track lines, with approximately 3,860 locomotives, of which about 1,706 are now ready for service.

The Union Switch & Signal Company has contracts for installations on 19 roads, the General Railway Signal Company on 14, the National Safety Appliance Company on 5, the Sprague Safety Control & Signal Corporation on 4, and the Miller Train Control Company, the American Train Control Corporation, and the Regan Safety Devices Company 1 each. The continuous system is being used on 18 roads, the intermittent inductive on 25, and the intermittent contact ramp on 3. Three-indication light type cab signals giving continuous indication of the condition of the block are used on the continuous train control of the A. T. & S. F., the C. R. R. of N. J., the N. & W. and the Reading, while the D. L. & W., the U. P. System, the O. W. R. & N., the L. & N., the I. C. System, the N. Y., N. H. & H., and several other roads using the continuous system employ the two-indication light type cab signal. The C. & N. W. uses audible type cab signals. Cab indicators of the visual and audible types are used with several of the intermittent train stop systems. Train control, including speed control, is used on 14 roads and the train stop on the remaining 31.

Therefore, taken as a whole, the year 1925 has been characterized by the completion of many train control divisions, by the granting of extensions of time on others and by diligent activity on the part of all except a half dozen roads.

Train Control Activities of the

Commission During 1925

During 1925 the Interstate Commerce Commission made no changes in the status of its train control orders with the exception of showing a spirit of tolerance in granting extensions of time for the completion of installations. The Western Maryland; the Buffalo, Rochester & Pittsburgh; the Chicago, St. Paul, Minneapolis & Omaha; and the Chicago & Erie were relieved from compliance with the first order. The first three roads named, together with the Kansas City Southern, the Oregon-Washington Railroad & Navigation, the Pittsburgh & Lake Erie and the Boston & Maine have been excused from the second order.

One of the important hearings on train control before the commission during the year was that on the Great Northern's petition requesting relief from the second order. Although considerable difference of opinion existed among the members of the commission the majority ruled that the petition of the carrier be denied. In view of the fact that the Great Northern territory is typical of western roads handling a light traffic and operating at fairly moderate speeds in open country, this decision apparently establishes a precedent which will discourage further petitions of a similar nature with possibly a few exceptions.

The activities of the commission have been confined

mostly to building up a force of inspectors which, under the jurisdiction of the Bureau of Signals and Train Control, has made inspections of preliminary test sections on 17 roads and final inspections of complete divisional installations on 9 roads.

Results of Preliminary Inspections

Reports have been rendered by the commission on 14 of the 17 inspections of preliminary test sections made during 1925; reports on similar inspections made in the latter part of 1924 were also made public late in that year, or early in 1925. The installation of so many test sections followed as a result of the commission's announcement in April, 1924, that if a road equipped a 20-mile section of its division and a proportionate number of its locomotives with train control the commission would co-operate in an inspection for the purpose of giving an opinion and advice as to the desirability of or objections to either the principle or construction of the system.

Aside from the C. & E. I., which installation was made prior to the order, only one final report on a complete installation, i. e., the O. W. R. & N., was rendered in 1925. The railroads, therefore, have depended a great deal on the opinions contained in the commission's reports of the preliminary inspections for guidance. The criticisms and suggestions in these reports may be classed in three groups: (1) suggestions to the manufacturer, covering changes in the detailed construction of valves and connections; (2) suggestions to the railroad on control features at specific points, and (3) criticism of a general nature applicable to similar systems on all roads. It is with criticisms of this third class that considerable controversy has arisen.

A criticism made of the intermittent magnetic systems was that "the track magnet may be displaced or removed without affecting the operation of the signal system, and, under these conditions, a stop signal and an automatic brake application would not result at the signal and the magnet in the rear." This criticism has been met by some roads by arranging that the core of the neutralizing track magnets form a part of one of the control circuits. Other roads have considered this additional complication as undesirable and unnecessary. The final opinion of the Interstate Commerce Commission on this question is, therefore, needed.

The question of fouling protection on turnouts and crossovers was raised in the reports on test installations on the M. P., the St. L.-S. F., the C. & A., the C. B. & Q., the C. N. O. & T. P., the G. N., the A. C. L., the L. V., the N. P., and the C. I. & L. In the majority of the cases this suggestion of the commission was as follows: "It is suggested that the type of fouling protection employed at sidings and crossovers be considered with a view to possibly securing increased protection."

As the majority of the roads use the standard shunt fouling circuits which have been considered as adequate protection in automatic signal systems, many have been undecided as to what action should be taken on this rather indefinite suggestion. One road has devised a special circuit for crossover protection, another road is using separate track circuits and others are providing derails on sidings, pipe-connected to the switch stand. The method of protection for sidings and crossovers that will be required or deemed adequate by the commission remains to be seen from future final reports on complete installations.

Recurrent acknowledgment at succeeding stop signals has been suggested as a requisite in the reports of preliminary inspections of continuous train control installations on the I. C., the D. L. & W., and the L. & N., the suggestion reading as follows: "No provision has been

made in this installation for having enginemen acknowledge succeeding stop signals."

This criticism was based on the fact that on July 22, 1924, the commission made public in a press notice its interpretation of sub-paragraph *b* of paragraph 2 of the specifications to the effect that "consistent practice required definite acknowledgment by enginemen at each succeeding signal indicating stop." In other words, the term "danger zone," in the specification is interpreted as being limited to mean each and every block separately.

The report of the preliminary inspection of the two-speed continuous system installed on the C. & N. W., included a description of the recurrent acknowledgment feature effective at succeeding points which are separated by a fixed distance by the operation of a distance cam, which starts operation when a danger indication is received. The report did not express specific approval or disapproval of this feature. The I. C., the C. M. & St. P., the N. Y., N. H. & H., and the three roads of the Pennsylvania system are taking measures to provide recurrent acknowledgment. Several other roads using continuous systems are awaiting developments on this question.

The commission came out definitely on this question in the final report on the O. W. R. & N., offering as one of the exceptions that "provision must be made requiring enginemen to acknowledge succeeding stop signals." The

carrier later petitioned the commission for a modification of its report, contending that recurrent acknowledgment is neither necessary nor desirable, and requesting that this requirement be eliminated. Results of the hearing on this question held on December 14, have not yet been made public. Another important feature of the final report of the O. W. R. & N. was the rather indefinite suggestion that the railroad consider whether the split reduction feature was desirable, which question was raised on account of the fact that the split reduction apparatus failed to function in certain cases during the inspection. Further developments have been made looking towards the elimination of the defective operating features used in the earlier designs of this apparatus, and opinions of those interested seem to be divided about equally as to whether the advantages to be gained by the use of split reduction are worth while. The final report on the Miller Train Control Company system of the intermittent ramp type of train stop, as installed on the Chicago & Eastern Illinois between Chicago and Danville, Ill., was issued on March 27, and this report formally approved the installation as meeting the requirements of the commission's order with the exception that ramp detectors were not required and might be removed, and that changes were to be made in six of the engine equipments to bring them up to a standard with the other engines.



Airview by Airmap Corporation of America, N. Y.

Hell Gate Bridge, New York



Separation of Communication Circuits and Power Lines Reduces Inductive Interference

1925 an Active Year in Railway Communication Work

*Construction activities greater than for several years—
Many extensions expected this year*

By R. S. Kenrick

THE installation of railway telephone and telegraph facilities follow fluctuations in traffic closely. This has been particularly evident during the past year when 1,307 miles of new pole line for railway service and 21,825 miles of copper telephone wire were installed. These figures reflect the steady increase which has been taking place each year in the use of the telephone for train dispatching and for long distance conversational and message purposes. This increase in new telephone wire mileage, coupled with the installation of telephone repeaters on long distance lines, the extension of the telephone for train dispatching purposes and an increased use of telegraph printers on heavy trunk line circuits, is an index of the developments taking place in this field to increase the capacity of communication facilities. This, our sixth annual review of activities in the railway telephone and telegraph field, was compiled from data furnished by 101 leading railroads in the United States and Canada.

Among the outstanding developments of the year was the completion by the Santa Fe of a new general telegraph office at Topeka, Kan., which is said to be the largest railway telegraph office in the world. Many improvements designed to increase the efficiency of handling routine traffic reports were incorporated in this office, which is equipped throughout with the latest type of equipment for handling railroad business economically.

A new semi-automatic telephone installation to serve the general offices of the Missouri Pacific at St. Louis, Mo., was placed in service in March, 1925, which exchange embodies as one of its component parts a separate and distinct circuit for the exclusive use of 25 of the executive officers of the road. This circuit is used for conference purposes without interruption by manual operators or from the semi-automatic system which serves all of the general offices. Since this installation there has been a noticeable speeding up of the telephone service and the president

and his highest officers have a private telephone system over which they may confer at will with a great saving of time and energy.

Construction Activities During the Year

The installation of 21,825 miles of copper telephone wire was the outstanding feature of railway communication activities during the past year. In addition, 2,155 miles of iron telephone wire was placed in service. To provide additional telegraph facilities 5,932 miles of copper wire and 840 miles of iron wire were also installed. The chief items of interest are briefly:

	Miles
Pole lines devoted to railway purposes.....	1,307
Copper telegraph wire.....	5,932
Iron telegraph wire.....	840
Copper telephone wire.....	21,825
Iron telephone wire.....	2,155
Road mileage dispatched by telegraph decreased.....	783
Road mileage dispatched by telephone increased.....	3,453.8
Long distance message or conversational lines.....	6,740.9
Miles of phantom telephone circuits.....	4,294.4
Telegraph circuit obtained by simplexing.....	7,607.5
Circuit mileage operated by duplex telegraph.....	7,378.2
Circuit mileage operated by automatic printing telegraph.....	3,462

The copper telephone wire installed during the year represents an increase of 10,090 miles over the corresponding figure for 1924. The largest installation reported during the year is that of the Southern Pacific which installed 3,715.7 miles of copper telephone wire. Other roads which reported large increases in their copper telephone wire mileage include the following:

	Miles
Pennsylvania.....	2,759.6
Missouri Pacific.....	2,164.3
Atlantic Coast Line.....	1,550
Illinois Central.....	1,182
Canadian National.....	943
Canadian Pacific.....	966
Chesapeake & Ohio.....	855.2
Central of Georgia.....	807
Oregon Short Line.....	745.8
New York, New Haven & Hartford.....	656
Nashville, Chattanooga & St. Louis.....	572

The Canadian National Railways reported the largest

telegraph installation of the year—2,734 miles of copper wire and 351 miles of iron wire. More telephone train dispatching circuits were installed during 1925 than a year ago, the present figures showing an increase of 1,319.4 miles over the figures for 1924.

The figures on telegraph dispatching are significant for while there was a slight increase, 82.7 miles of road, in these circuits in 1924, there was a net decrease of 783 miles during the past year. This is due largely to the fact that lines formerly dispatched by telegraph are now being dispatched by telephone. The largest telephone train dispatching installation made during 1925 was on the Pennsylvania, which reported 650.9 road miles of telephone dispatching circuits placed in service and a decrease of 378.9 miles of road dispatched by telegraph.

Large Increase in Long Distance Telephone Service

It is significant that 3,835.4 more miles of long distance message or conversational circuits were installed in 1925 than in 1924. The 1924 figures represented a decrease of 2,963.5 miles under the 1923 figures. The Southern Pacific reported the completion of 1,198 miles of such circuits, while the Canadian Pacific completed 868 miles and the Pennsylvania 810.1 miles. To increase the capacity of their communication plants on heavy traffic districts, four large roads installed automatic printing telegraph equipment during 1925. The largest installation was reported by the Illinois Central which installed 1,902 miles of printing telegraph circuits. Two units of the Union Pacific System, the Oregon Short Line and the Oregon-Washington Railroad & Navigation Co., completed 495.1 miles and 398.9 miles respectively of multiplex printing telegraph circuits; the Pennsylvania installed 376 miles of these circuits and the St. Louis-San Francisco, 284 miles.

Replies to a questionnaire from the *Railway Age*, received from 50 superintendents of telegraph indicate that only 13 believe that they are behind in the maintenance of their outside plant facilities for periods varying from 3 months to 5 years. Of these 13 roads, 8 estimated that they are not more than 2 years behind in their maintenance program.

Work Under Way at the Close of the Year

From the relatively small amount of telegraph and telephone work listed as under construction at the end of the year, it appears that the railroads generally were able to complete most of their construction scheduled for 1925. Eight roads reported 3,186.9 miles of copper telephone wire now under construction, the largest of which is that of the Atlantic Coast Line which is now installing 1,177 miles of such wire. Seven roads reported 279.4 miles of new pole line devoted to railway communication purposes now under construction. At the close of the year telephone dispatching circuits were under construction on 408 miles of road; long distance message or conversational telephone lines on 616.6 miles of road; phantom telephone circuits on 486.1 miles of road; and simplex telegraph circuits on 469.4 miles of road.

Continued Extension of Telephone

Service Contemplated

While budgets for 1926 are still being considered on a majority of the roads reporting, it is of interest to note that 30 roads contemplate construction work this year, involving the installation of 21,540 miles of copper telephone wire, which is approximately equivalent to 45 per cent of the mileage which 47 superintendents of telegraph believe should be installed in 1926 to meet present and expected demands adequately. About 5,000 miles of new copper telephone wire is planned by the

Southern Pacific alone while other contemplated installations include the following:

	Miles
New York, New Haven & Hartford.....	2,148
Pennsylvania	1,672.2
Missouri Pacific	1,668
New York Central	1,625
Chicago, Rock Island & Pacific.....	1,300
Boston & Maine	952
Atchison, Topeka & Santa Fe.....	948.2
Louisville & Nashville	874
Central of Georgia	728
International-Great Northern	644
Union Pacific	503.7

Eleven roads are planning telephone train dispatching circuits on 2,594.3 miles of road, while 2 roads contemplate a decrease of 275 miles of road in telegraph train dispatching facilities. An increase of 7,704.4 miles of long distance message or conversational telephone lines is planned by 15 roads. By far the largest installation of this nature is that contemplated by the Southern Pacific which intends to install 3,000 miles of such circuits this year. About 2,450 miles of phantom telephone circuits are being considered by 7 roads. Increased facilities for telegraph work obtained by simplex and compositing are planned by several roads which in the aggregate will add about 8,109 miles of such circuits. Two roads contemplate an extension of 2,000 miles of circuit-operated duplex telegraph. While many railway telegraph officers predict an increased installation of telegraph printers this year, only one road, the Santa Fe, is at present definitely considering an installation for this year, to the extent of 2,229 miles of circuit. The construction of 1,055 miles of new pole lines for railway service is contemplated by 15 roads. In addition 5 roads reported that approximately 1,090 miles of pole line will be reconstructed during this year.

Plan for the Future

As a result of the general prosperity of the railroads, 18 telegraph officers expressed the opinion that the outlook for increased construction and maintenance programs this year seems favorable. Other roads do not anticipate any increase in their maintenance and construction programs as they have been able to keep the average condition of their lines as good as general business activities warrant. One of the large northwestern roads whose maintenance program is up-to-date, reports that: "The expenditures for maintenance have been consistently reduced each year for the past 5 years and probably will start increasing again in 1927 or 1928. The reason for this is that the condition of our lines some 6 or 8 years ago was such that immediate replacement of some of the heavier leads was an absolute necessity, and in order to permit of an excess of this type of work we arranged to carry on through temporary repairs, a considerable mileage of the lighter type of line. With the heavy main line work out of the way, the cost of the branch line replacements, of course, ran considerably below the previous year's figures. The mileage replaced has been held very consistently at a definite percentage and the variations in expenditures have been due to the type of mileage replaced and not to its gross amount."

Most of the roads reported that their maintenance work has been kept up on a definite and predetermined basis because communication service cannot be maintained satisfactorily unless the outside plant is maintained at a certain efficiency through consistent and constant replacement each year instead of allowing such work to run for several years at a time. Dependent upon the general financial conditions and the immediate needs of the service, many superintendents of telegraph believe that a varying amount of new or improved facilities should be added to this maintenance work each year by properly planning the work so as to fit into a general scheme that

will eventually provide the maximum of service from each expenditure. Expressed in another way, a communication improvement program should be made in advance to cover a long period of years and all expenditures for that service should be fitted into this plan.

The installation of new telephone wire for train dispatching and long distance message or conversational purposes should be given preference this year according to 13 telegraph officers, while 7 reported that maintenance of outside plant facilities should have preference.

What of the Future?

Scanning the future, a number of developments in the railway communication field show possibilities of yielding fruitful results in the not too far distant future. The extension of telephone circuits, and of automatic telegraph printers, and the application of carrier currents and radio to the railway field are some of the things which telegraph officers are looking forward to. One road which has an installation of long line telephone repeaters on one end of a line for distances up to 1,000 miles has recently placed an order for an additional set of repeaters to improve transmission on the other end of its long distance circuit where the operating conditions are particularly bad and hopes to continue this gradual extension of long distance telephone service as fast as the demand for distance justifies the expense. This road has also experimented some-

what with radio on moving passenger trains, but has found that the net results are not worth the expense in the territory which it serves. Experiments have also been carried on with radio as an emergency operating facility and this road believes that a definite and desirable place will eventually be found for it as an adjunct to wire communication in those sections of the country where wire maintenance is particularly difficult. This road plans to follow this development somewhat further and if it achieves the results for which it is working, it will probably enter the radio field.

Radio

The opinion is quite general that the development of radio or carrier systems for special service such as head-to-rear-end communication on long freight trains will make possible the employment of these means within a short space of time. Such a system has been developed in connection with the electrification of the Virginian between Mullins, W. Va., and Clark's Gap, a distance of 15 miles, where it is possible to see one end of a train from the other at only a few points. In order to overcome these conditions and at the same time to solve the difficult task of handling a heavy train, two of the electric locomotives have been equipped with a wired wireless communicating system as described in the *Railway Age* of September 26, 1925, page 553.



Express Passenger Train at Göschenen, Switzerland

Railways in Receivership

*Mileage operated by receivers on December 31
totalled 18,039; at end of 1924, 10,487 miles*

By Charles W. Foss

ON December 31, 1925, there were in the hands of receivers but 48 railroad properties operating a total of 18,039 miles of line. The number of roads was five less than at the end of 1924 and, as in that year, the smallest number since 1912. However, because one of the roads which went into the hands of receivers during 1925 was the Chicago, Milwaukee & St. Paul with its 11,000 miles of line, the mileage operated by receivers at the end of 1925 was 7,552 greater than at the end of 1924, and the largest number of miles to be operated by receivers since 1918.

During the year 1925, only five companies went into the hands of receivers. Since 1876, there have been only five years in all in which such a small number of prop-

ties was taken over by the courts. But again, because one of the roads was the Chicago, Milwaukee & St. Paul,

TABLE I—RECEIVERSHIPS ESTABLISHED IN 1925

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
California & Oregon Coast.....	15	.....	\$350,000
Chicago, Milwaukee & St. Paul..	11,007	\$443,982,796	233,379,384
Frankfort & Cincinnati.....	41	.....	40,000
Nevada Copper Belt.....	41	622,000	1,000,000
Rio Grande Railway.....	26	280,400	25,000
Five companies.....	11,130	\$444,885,196	\$234,794,384

there have been but two years since 1876 in which the mileage of roads going into the hands of receivers was greater than it was in 1925.

TABLE II—RAILROADS IN THE HANDS OF RECEIVERS

Road	Mileage operated	Mileage owned	Date of receivership	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Alabama, Florida & Gulf.....	32	32	June 4, 1924	None	\$50,000	\$50,000	
Alabama Northern	7	7	Mar. 4, 1924	None	35,000	35,000	
Atlanta, Birmingham & Atlantic.....	640	637	Feb. 25, 1921	10,135,907	30,000,000	40,135,907	
Atlantic & Yadkin.....	163	163	Mar. 24, 1924	1,500,000	1,000,000	2,500,000	
Birmingham, Columbus & St. Andrews....	38	19	Dec. 24, 1908	250,000	None	250,000	
California & Oregon Coast.....	15	15	Feb. 18, 1925	None	350,000	350,000	
Cape Girardeau Northern.....	12	104	Apr. 14, 1914	1,500,000	110,000	1,500,000	
Caro Northern	17	17	Sept. 1, 1921	None	100,000	100,000	
Chicago & Alton.....	1,056	691	Aug. 30, 1922	91,195,000	39,955,500	131,150,500	
Chicago, Milwaukee & St. Paul.....	11,007	10,142	Mar. 18, 1925	443,982,796	233,379,384	677,362,180	Reorganization plan proposed
Chicago, Peoria & St. Louis.....	198	198	Aug. 1, 1914	3,833,000	4,000,000	7,833,000	Contracts for sale arranged
Dansville & Mount Morris.....	18	16	June 8, 1894	150,000	50,000	200,000	
Delaware & Northern.....	40	40	Mar. 16, 1921	None	1,250,000	1,250,000	
Denver & Salt Lake.....	255	252	Aug. 16, 1917	11,802,149	583,515	12,385,664	Reorganization plan operative
Eastern Kentucky	36	36	Mar. 31, 1919	None	3,455,900	3,455,900	Plan for abandonment pending before I. C. C.
Ensley Southern	29	29	July 1, 1924	.....	.....	.....	Subsidiary of Southern Ry.
Ettrick & Northern.....	10	10	June 28, 1922	49,300	144,000	193,300	
Frankfort & Cincinnati.....	41	41	Nov. 1, 1925	None	40,000	40,000	Company asked I. C. C. permission to abandon line
Gainesville & Northwestern.....	37	35	Dec. 8, 1923	75,000	750,000	825,000	
Gainesville Midland.....	74	72	Feb. 15, 1921	973,011	550,000	1,523,011	Early sale expected
Georgia & Florida.....	445	442	Mar. 27, 1915	8,216,000	8,695,000	16,911,000	Reorganization and extension under consideration
Gulf, Texas & Western.....	130	99	Jan. 24, 1921	2,000,000	500,000	2,500,000	
Kansas & Oklahoma.....	19	19	Apr. 17, 1923	None	288,900	288,900	
Kansas City, Kaw Valley & Western.....	41	35	July 19, 1924	1,386,000	740,500	2,126,500	
Kansas, Oklahoma & Gulf.....	314	312	June 7, 1924	10,648,282	9,337,279	19,985,561	
Loranger, Louisiana & North-Eastern.....	10	8	Jan. 9, 1922	100,000	25,000	125,000	
Minneapolis & St. Louis.....	1,627	1,513	July 26, 1923	45,851,575	25,792,600	71,644,175	
Nevada Copper Belt.....	41	41	Apr. 2, 1925	622,000	1,000,000	1,622,000	
North & South.....	41	41	Aug. 1, 1924	None	None	None	
Oklahoma & Arkansas.....	20	20	Aug. 15, 1924	.....	307,500	307,500	
Paris & Mt. Pleasant.....	51	51	Feb. 26, 1920	690,000	75,000	765,000	
Peoria Railway Terminal.....	9	8	Aug. 3, 1922	2,444,000	1,000,000	3,444,000	Advertised for sale on Jan. 6, 1926
Pine Bluff & Northern.....	8	8	Feb. 9, 1916	None	160,000	160,000	
Pittsburg, Shawmut & Northern.....	210	190	Aug. 1, 1905	16,825,600	15,000,000	31,825,600	
Rio Grande Railway.....	26	26	Nov. , 1925	280,400	25,000	305,400	
St. Louis, El Reno & Western.....	42	42	Oct. 9, 1915	817,000	970,800	1,787,800	Line to be sold and junked
Sandy River & Rangeley Lakes.....	102	102	July 8, 1923	837,000	340,000	1,177,000	
San Luis Southern.....	32	32	Feb. 29, 1924	327,000	1,000,000	1,327,000	Foreclosure sale scheduled for Jan. 20, 1926
Saratoga & Encampment.....	44	44	Dec. 8, 1924	.....	.....	.....
Savannah & Atlanta.....	145	145	Mar. 4, 1921	3,375,000	2,250,000	5,625,000	
Sharpsville Railroad	21	21	Jan. 21, 1897	None	350,000	350,000	
Tallulah Falls Railway.....	57	57	June 24, 1923	1,519,000	523,400	1,842,400	
Toledo, Peoria & Western.....	248	231	July 2, 1917	4,895,000	4,076,900	8,971,900	No offers at foreclosure sale on December 10
Trinity & Brazos Valley.....	367	303	June 16, 1914	9,357,014	304,000	9,661,014	
Wabash, Chester & Western.....	65	65	Jan. 4, 1924	721,874	1,250,000	1,971,874	
Wellington & Powellsville.....	24	24	Sept. 28, 1923	.....	90,000	90,000	May be sold in Jan. or Feb., 1926
Wichita Falls, Ranger & Fort Worth.....	75	75	Dec. 26, 1921	.....	120,000	120,000	
Wichita Northwestern	100	100	Nov. 10, 1922	381,750	1,690,000	2,071,750	
	18,039	16,610					

TABLE III—FORECLOSURE SALES IN 1925

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding	Remarks
Birmingham & Southeastern.....	48	\$680,000	\$728,000	
Detroit, Bay City & Western.....	105	729,000	450,000	I. C. C. Authorized Abandonment.
Manistee & North-Eastern.....	208	892,000	2,000,000	
Muscataine, Burlington & Southern.....	54	569,900	750,000	Reorganized as Burlington, Muscatine & Northwestern.
Muscle Shoals, Birmingham & Pensacola..	185	601,500	2,500,000	Acquired by St. Louis-San Francisco.
Potomac, Fredericksburg & Piedmont....	38	.....	65,000	Acquired by Orange & Fredericksburg.
Five companies.....	638	\$3,472,400	\$6,493,000	

The mileage of the five roads totaled 11,130, only 123 of which consisted of the mileage of the four roads other

TABLE IV—RAILROAD MILEAGE IN THE HANDS OF RECEIVERS

(Figures to 1923, inclusive, from I. C. C. Statistics for Year Ended December 31, 1923. Figures for 1924 and 1925 Compiled by Railway Age)

Years ended	Miles of road operated by receivers at close of year	Net change during the years in miles of road operated	Number of roads in charge of receivers at close of year
June 30, 1894.....	40,819	.....	192
1895.....	37,856	-2,963	169
1896.....	30,476	-7,380	151
1897.....	18,862	-11,614	128
1898.....	12,745	-6,117	94
1899.....	9,853	-2,892	71
1900.....	4,178	-5,675	52
1901.....	2,497	-1,681	45
1902.....	1,475	-1,022	27
1903.....	1,185	-290	27
1904.....	1,323	+138	28
1905.....	3,971	+527	26
1906.....	3,926	+3,175	34
1907.....	9,529	-45	29
1908.....	10,530	+5,603	52
1909.....	5,257	+1,001	44
1910.....	4,593	-5,273	39
1911.....	9,786	-664	39
1912.....	16,286	+5,193	44
1913.....	18,608	+6,500	49
1914.....	30,223	+2,322	68
1915.....	37,535	+11,615	85
1916.....	34,804	+7,130	94
Dec. 31, 1916.....	17,376	-2,350	80
1917.....	19,208	-17,428	82
1918.....	16,590	-1,832	74
1919.....	16,290	-2,618	65
1920.....	13,512	-300	61
1921.....	15,259	-2,778	68
1922.....	12,623	+1,747	64
1923.....	10,487	-2,310	64
1924.....	18,039	-2,636	53
1925.....		+7,552	48

*Represents decrease for six months.

TABLE V—ROADS GOING INTO RECEIVERSHIP, 1876 TO 1925

Year	Number of roads	Miles	Bonds and stocks
1876.....	42	6,662	\$467,000,000
1877.....	38	3,637	220,294,000
1878.....	27	2,320	92,385,000
1879.....	12	1,102	39,367,000
1880.....	13	885	140,265,000
1881.....	5	110	3,742,000
1882.....	12	912	39,074,000
1883.....	11	1,990	108,470,000
1884.....	37	11,038	714,755,000
1885.....	44	8,836	385,460,000
1886.....	13	1,799	70,346,000
1887.....	9	1,046	90,318,000
1888.....	22	3,270	186,814,000
1889.....	22	3,803	99,664,000
1890.....	26	2,963	105,007,000
1891.....	26	2,159	84,479,000
1892.....	36	10,508	357,692,000
1893.....	74	29,340	1,781,046,000
1894.....	38	7,025	395,791,000
1895.....	31	4,089	369,075,000
1896.....	34	5,441	275,597,000
1897.....	18	1,537	92,909,000
1898.....	18	2,069	138,701,000
1899.....	10	1,019	52,285,000
1900.....	16	1,165	78,234,000
1901.....	4	73	1,627,000
1902.....	5	278	5,835,000
1903.....	9	229	18,823,000
1904.....	8	744	36,069,000
1905.....	10	3,593	176,321,000
1906.....	6	204	55,042,000
1907.....	7	317	13,585,000
1908.....	24	8,009	596,359,000
1909.....	5	859	78,095,000
1910.....	7	735	51,427,500
1911.....	5	2,606	210,606,882
1912.....	13	3,784	182,112,497
1913.....	17	9,020	477,780,820
1914.....	22	4,222	199,571,446
1915.....	12	20,143	1,070,808,628
1916.....	9	4,439	208,159,689
1917.....	19	2,486	61,169,962
1918.....	8	3,519	242,090,800
1919.....	7	244	11,886,779
1920.....	10	541	21,620,150
1921.....	14	1,744	63,872,113
1922.....	12	4,330	329,114,860
1923.....	10	2,218	87,913,581
1924.....	11	920	30,223,372
1925.....	5	11,130	679,679,580

than the St. Paul. As was the case last year, there are now shown in the list of roads in the hands of receivers but four roads having a mileage of 500 or more; the Atlanta, Birmingham & Atlantic, the Chicago & Alton, the Chicago, Milwaukee & St. Paul and the Minneapolis & St. Louis. These four roads include 14,330 of the total of 18,247 miles, and it is noteworthy that the latter three, which are in receivership because of the adverse conditions now ruling in the northwestern and central western regions, constitute no less than 75 per cent of the railway mileage in this country that is at the present time in the hands of receivers.

During the past year, several roads have disappeared from the receivership list. These include notably, the

TABLE VI—SUMMARY OF FORECLOSURE SALES, 1876 TO 1925

Year	Number of roads	Miles	Bonds and stocks
1876.....	30	3,840	\$217,848,000
1877.....	54	3,875	198,984,000
1878.....	48	3,906	311,631,000
1879.....	65	4,909	243,288,000
1880.....	31	3,775	263,882,000
1881.....	29	2,617	137,923,000
1882.....	16	867	65,426,000
1883.....	18	1,354	47,100,000
1884.....	15	710	23,504,000
1885.....	22	3,156	278,394,000
1886.....	45	7,687	374,109,000
1887.....	31	5,478	328,181,000
1888.....	19	1,596	64,555,000
1889.....	25	2,930	137,815,000
1890.....	29	3,825	182,495,000
1891.....	21	3,223	169,069,000
1892.....	28	1,922	95,898,000
1893.....	25	1,613	79,924,000
1894.....	42	5,643	318,999,000
1895.....	52	12,831	761,791,000
1896.....	58	13,730	1,150,377,000
1897.....	42	6,675	517,680,000
1898.....	47	6,054	252,910,000
1899.....	32	4,294	267,534,000
1900.....	24	3,477	190,374,000
1901.....	17	1,139	85,808,000
1902.....	20	693	39,788,000
1903.....	13	555	15,885,000
1904.....	13	524	28,266,000
1905.....	6	679	20,307,000
1906.....	8	262	10,400,000
1907.....	6	114	13,777,000
1908.....	3	138	2,547,000
1909.....	12	2,629	250,033,000
1910.....	17	1,100	93,660,109
1911.....	13	1,386	40,741,543
1912.....	12	661	25,910,990
1913.....	6	1,159	86,163,850
1914.....	9	1,470	83,189,500
1915.....	11	3,914	285,258,782
1916.....	26	8,355	703,444,855
1917.....	20	10,963	557,846,348
1918.....	11	763	24,735,187
1919.....	8	459	15,479,587
1920.....	7	380	7,676,200
1921.....	11	4,173	306,123,942
1922.....	15	6,151	299,491,646
1923.....	8	637	14,622,900
1924.....	14	3,992	269,251,082
1925.....	6	638	9,965,000

Denver & Rio Grande Western, which had not been turned over to its new corporate management in time to remove it from the list of railroads in the hands of receivers as of December 31, 1924; the Kansas City, Mexico & Orient, which similarly to the Denver, Rio Grande & Western had been sold at foreclosure in 1924 but was not yet out of the receivers' hands at the end of the year; the Muscle Shoals, Birmingham & Pensacola, sold at foreclosure in 1925 and since taken over by the St. Louis-San Francisco, and finally the San Antonio, Uvalde & Gulf, which has been taken over by the Missouri Pacific interests without foreclosure sale. Six companies—638 miles—underwent foreclosure sales in 1925.

A Chronological Review of 1925

*Leading events of the year in the railway world, arranged for
ready reference according to dates*

By R. A. Doster

JANUARY

- January 2, 1925.—S. Davies Warfield, organizer of the National Association of Owners of Railroad Securities, and president of that organization since its inception in May, 1917, resigned and was succeeded by Milton W. Harrison, vice-president of the association.
- January 6.—J. S. Pyeatt, president of the Gulf Coast Lines, was elected president of the Denver & Rio Grande Western, to succeed T. H. Beacon, who had been receiver since August, 1923.
- January 8.—The Illinois Central acquired the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific through lease, and purchased the Gulf & Ship Island.
- January 12.—The Interstate Commerce Commission reaffirmed its previous decision of June 13, 1923, in which it ruled that the practice of the railroads in assigning private cars and system or foreign line cars for railway fuel to bituminous coal mines in excess of the ratable share contemporaneously distributed to mines upon their lines which do not receive assigned cars, was unduly discriminatory against mines not receiving assigned cars.
- January 22.—Increased rates of pay for the transportation of the U. S. mails on 23 western short line railroads were established by the Interstate Commerce Commission.
- January 23.—Hearings on the Gooding bill which would prohibit the railways from reducing rates to meet water competition without making corresponding reductions in rates to intermediate points, were concluded.
- January 27.—The Hoch-Smith resolution directing the Interstate Commerce Commission to make an investigation of the railroad rate structure and to make such readjustments and changes as may be found necessary, was passed by the Senate.
- January 31.—A petition for the appointment of a receiver for the Boston & Maine was denied by the United States District Court at Concord, N. H.

FEBRUARY

- February 4.—An investigation of eastern freight rates was begun by the Interstate Commerce Commission at Washington.
- February 9.—The Pullman surcharge was held reasonable by the Interstate Commerce Commission.
- February 9.—Rules governing the distribution of cars to coal mines and the rating of mines as the basis for distribution were ordered continued in effect by the Interstate Commerce Commission.
- February 16.—The Interstate Commerce Commission started hearings at Chicago in an investigation of the division of freight rates in the western and Mountain Pacific territories.
- February 17.—The Interstate Commerce Commission issued a decision finding that the divisions accorded the southern carriers of joint eastbound transcontinental class and commodity rates, from points in Pacific coast territory to points in southern territory, were unreasonable and inequitable and prescribed reasonable divisions for the future on a percentage basis subject to the local rates from the respective gateways to destination points as a maximum.
- February 18.—The Interstate Commerce Commission approved a two-year contract between the Northern Pacific, the Great Northern and the Oregon-Washington Railroad & Navigation Co., providing for the operation of joint passenger service between Seattle, Wash., and Tacoma and Portland, Ore., and the pooling of the earnings.
- February 20.—Commissioner M. W. Potter of the Interstate Commerce Commission resigned from the commission.
- February 21.—The joint application of the Chesapeake & Ohio,

the Hocking Valley, the Erie, the Pere Marquette and the New York, Chicago & St. Louis, for authority for the latter company to acquire control of the other systems was filed with the Interstate Commerce Commission.

February 27.—The Pullman surcharge bill was defeated in the Senate.

February 28.—The Gooding bill was defeated in the Senate.

MARCH

- March 11.—The Chicago, Rock Island & Pacific acquired control of the St. Louis-Southwestern by purchase of stock.
- March 12.—A general investigation of the freight rate structure of all common carriers, Docket 17,000, was instituted by the Interstate Commerce Commission.
- March 17.—The Chicago, Milwaukee & St. Paul was placed in receivership by the United States District Court at Chicago.
- March 22.—Thirteen persons were killed and 11 were injured when a westbound Southern Pacific passenger train collided head-on with an eastbound train at Ricohoc, La.
- March 23.—The John Fritz Gold Metal for notable scientific or industrial achievement was awarded to John F. Stevens, formerly chief engineer of the Great Northern, vice-president of the Chicago, Rock Island & Pacific, and of the New York, New Haven & Hartford, and president of the Spokane, Portland & Seattle.

APRIL

- April 1.—Thomas F. Woodlock was appointed a recess member of the Interstate Commerce Commission.
- April 4.—The Southern Pacific was authorized by the Interstate Commerce Commission to acquire the entire capital stock of the San Antonio & Aransas Pass and to lease that property to the Galveston, Harrisburg & San Antonio.
- April 15.—Hearings on the Van Sweringen proposal for unified control and operation of the New York, Chicago & St. Louis, the Chesapeake & Ohio, the Hocking Valley, the Erie and the Pere Marquette were begun by the Interstate Commerce Commission.
- April 18.—The Yazoo & Mississippi Valley applied to the Interstate Commerce Commission for authority to acquire control of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific by lease.
- April 30.—The western railroads filed a petition with the Interstate Commerce Commission asking for increases in freight rates.

MAY

- May 3.—The Interstate Commerce Commission reorganized its Bureau of Service and made provision for keeping up a study of the efficiency and economy of railroad management.
- May 15.—The Chicago Union Station was placed in service.
- May 16.—The railroads of the United States filed a petition with the Interstate Commerce Commission asking it to re-examine the rates and the service performed in the transportation of U. S. mail with a view of ordering higher rates.
- May 16.—The Great Northern started to electrify its line from Skykomish, Wash., to Tye.
- May 27.—The Interstate Commerce Commission decided that the basic rate of fare for scrip coupon books, 3.6 cents per mile, is reasonable and that low rate mileage books are not required.

JUNE

- June 1.—Julius Kruttschnitt retired as chairman of the executive committee and of the board of directors of the Southern Pacific.
- June 1.—The Wabash acquired control of the Ann Arbor.
- June 8.—B. W. Hooper was re-elected chairman of the United States Railroad Labor Board.

- June 10.—John M. Davis, president of Manning, Maxwell & Moore, was elected president of the Delaware, Lackawanna & Western, to succeed William H. Truesdale, who became chairman of the board.
- June 12.—Warren S. Stone, president of the Brotherhood of Locomotive Engineers, and an officer of its various banking, investment and industrial enterprises, died at Cleveland, O.
- June 13.—The Spokane, Portland & Seattle Transportation Co. purchased the Columbia Stages, a competing bus line operating between Portland, Ore., and Seaside.
- June 15. Julius Kruttschnitt died.
- June 20.—The Denver & Interurban Motor Co. was incorporated at Denver, Colo., by the Colorado & Southern to operate buses between Denver and Boulder.
- June 21.—Western roads filed a brief with the Interstate Commerce Commission in the western live stock case, contending that the Hoch-Smith resolution requires an advance of 20 per cent in live stock rates.
- June 22.—International Railway Congress opened in London.
- June 23.—Fred W. Sargent, vice-president and general counsel of the Chicago & North Western, was elected president, to succeed W. H. Finley, resigned. Marvin Hughitt, Sr., chairman of the board of directors, retired.
- June 27.—The Potter plan, providing for a rate increase and the pooling and distribution of the proceeds according to the carriers' needs, was proposed by Mark W. Potter, former Interstate Commerce Commissioner and one of the receivers of the Chicago, Milwaukee & St. Paul.
- June 27.—A number of middle western railroads resumed operation of low fare excursions over week ends.

JULY

- July 1.—The Stockton & Darlington in England celebrated the centennial of the running of the first train between Stockton and Darlington, which occurred on September 27, 1825.
- July 9.—T. C. Powell, vice-president in charge of traffic of the Erie, was elected president of the Chicago & Eastern Illinois, to succeed W. J. Jackson, who was elected chairman of the executive committee.
- July 11.—The Norfolk & Western applied to the Interstate Commerce Commission for authority to acquire control of the Virginian by lease for 999 years.
- July 14.—Representative members of the freight car repair industry asked the Interstate Commerce Commission to investigate freight car repairing by railroads, change its decision of 1921, and provide a system of accounting which will develop true costs in any activity in which the roads may engage.
- July 21.—Compensation of reorganization managers in connection with the reorganization of the Missouri-Kansas-Texas and the fee for counsel was fixed by the Interstate Commerce Commission.
- July 25.—The Interstate Commerce Commission issued a modification of the uniform system of accounts relating to the cost of repairs to equipment under which all repairs to equipment shall be charged to operating expenses.

AUGUST

- August 2.—The Interstate Commerce Commission prescribed an upward revision of class freight rates in southern territory to become effective January 1, 1926.
- August 12.—The acquisition by the Chicago, Rock Island & Pacific of control of the St. Louis-Southwestern by purchase of the capital stock was found not to be in the public interest by C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission.
- August 15.—Horizontal reductions in freight rates on anthracite coal were ordered cancelled by the Interstate Commerce Commission.
- August 22.—Western railroads issued statements indicating that the advances in freight rates to be asked for under ex parte 87 would be 11 per cent.

SEPTEMBER

- September 8.—Western roads amended their petition for increased rates, ex parte 87, by suggesting an increase of 5 per cent instead of 11.
- September 8.—Hearings before the Interstate Commerce Commission on the application of western carriers for general

increases in freight rates, Docket 17,000, were opened in Chicago.

September 21.—Electric operation on the Virginian was inaugurated.

September 30.—W. W. Atterbury, vice-president of the Pennsylvania, was elected president, to succeed Samuel Rea, retired.

OCTOBER

October 5.—The denial of the application of the New York, Pittsburgh & Chicago for a certificate of public convenience and necessity for the construction of a line across the state of Pennsylvania was recommended to the Interstate Commerce Commission by C. V. Burnside.

October 12.—The Interstate Commerce Commission began hearings on the application of the Norfolk & Western for authority to lease the Virginian for 999 years.

October 14.—The Kansas City Southern acquired the stock of the St. Louis-Southwestern, held by the Chicago, Rock Island & Pacific.

October 19.—The Order of Railway Telegraphers ordered a strike on the Atlantic Coast Line because of a decision by the Labor Board denying increased pay and changes in working conditions.

October 22.—The American Railway Association adopted new rail specifications.

October 26.—George M. Basford, president of the G. M. Basford Company, New York, died suddenly.

October 27.—The "Sunnyland," a passenger train of the St. Louis-San Francisco, was derailed at Victoria, Miss., killing 23 and injuring more than 75.

October 31.—George A. Post, president of the George A. Post Company, chairman of the railroad committee of the Chamber of Commerce of the United States and organizer of the Railway Supply Manufacturers' Association, died of heart failure.

NOVEMBER

November 2.—N. L. Howard, general manager of the Chicago Union Station Company, was elected president of the Chicago Great Western, to succeed Samuel M. Felton, who was elected chairman of the board.

November 14.—Acquisition of the San Antonio, Uvalde & Gulf by the New Orleans, Texas & Mexico, was approved by the Interstate Commerce Commission.

November 16.—The Mechanical Division, A. R. A., announced that standards for 4C and 4D double sheathed, wooden sheathed box cars had been adopted.

November 17.—Western carriers submitted a supplemental application under ex parte 87 asking for a complete revision and readjustment of class freight rates.

November 18.—The E. H. Harriman gold medal for the best record in accident prevention among the American railroads for the year 1924 was awarded to the Union Pacific by the American Museum of Safety.

November 29.—The Boston & Maine was given permission by the Interstate Commerce Commission to abandon 58 miles of lines out of 155 miles asked for.

November 29.—Andrew Fletcher, president of the American Locomotive Company, died.

November 30.—Hearings in connection with the investigation of the receivership of the Chicago, Milwaukee & St. Paul were begun by the Interstate Commerce Commission.

DECEMBER

December 1.—William H. Woodin, president of the American Car & Foundry Co., was also elected president of the American Locomotive Company.

December 14.—The resignation of James C. Davis, the Director General of Railroads and agent to the President, effective December 31, was accepted, practically all claims of the carriers having been adjusted. Remaining details will be taken over by Andrew W. Mellon, Secretary of the Treasury.

December 16.—A bill drafted by the National Association of Railway and Utilities Commissioners to provide for the regulation of interstate commerce by motor vehicles operating as common carriers on the public highways has been introduced in Congress by Senator Cummins at the request of the state commissioners.

Foreign Railway Section

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L. & N. E. Garratt Type Locomotive for Pusher Service

British and Irish Railways Have a Trying Year

Irish roads suffer particularly from high wages and low earnings—Outlook brighter, however

By W. H. Fraser

THE railways of Great Britain have been engaged in a titanic struggle during the past year to maintain revenue and dividends in the face of adverse conditions. The railway centenary celebrations held promise of a new century of prosperity and it seemed, at this time last year, reasonable to presume that at the end of 12 months British railways would be able to look back with satisfaction on their year's results, in spite of the fact that they concluded the previous year with a decrease in revenue of £3,112,200. The fact that for the 43 weeks to the end of October there was further decrease of £3,333,000 in the total traffic receipts of the four main groups—the London Midland & Scottish, London & North Eastern, Great Western and Southern, indicates that this hope has not been realized.

Coal Traffic Losses

Trade depression has been responsible for the setback, but coal is the particular bugbear at the root of the industrial stagnation, and so far all efforts to solve the problem have been unavailing. But there are signs of an improvement, and particularly since the conclusion of the Locarno Peace Pact, which has had a distinctly uplifting effect on British trade.

Even the coal situation, bad as it is, has its bright spot. There is quite a boom in anthracite from a virgin anthracite field near Swansea, which has recently been tapped through the agency of a new line constructed by the Great Western. It is estimated that this field is capable of an output of 23,000,000 tons to the square mile.

The Passenger Position—Many Excursions

Although there has been a substantial decrease in passenger receipts for the 43 weeks under review, the position

is not so unsatisfactory as the figures would appear to indicate. The decrease for the four groups was £611,000, but in the case of the Southern Railway there was actually an increase of £28,000. The lower passenger receipts are entirely due to the falling off in provincial travel to the Wembley Exhibition. This traffic was a very substantial "nest-egg" to the London companies in 1924; but generally speaking there has been a gratifying increase in long distance passenger travel.

One of the most noteworthy features of the passenger business in 1925 has been the resuscitation of cheap excursions. Early in the year the companies decided to offer half-day excursion facilities, mostly on Sundays, at fares almost approximating pre-war basis. As a rule the trains left in the mid-morning, ran non-stop to their destination, sometimes as much as 130 miles away, and carried a restaurant car, passengers being given about six hours at some favorite resort for a fare of anything between 5 shillings (\$1.25) and 7 shillings sixpence (\$1.85). These trips have been enormously popular. On one Sunday the Great Western Railway had to provide 10 trains to carry 8,000 people from Birmingham to Weston-super-Mare, a popular Somersetshire watering place.

Events of the Past Year

Outstanding events in British railway history last year were the centenary celebrations and the International Railway Congress, held in London.

The centenary celebrations were opened at Darlington by H.R.H. the Duke of York, accompanied by H.R.H. the Duchess of York, with all the pomp and ceremony that such an historic event was entitled to. An imposing procession of rolling stock and locomotives illustrated a century's progress, and a replica of the original train which

TABLE A.—BRITISH GROUPED RAILWAYS TRAFFIC RETURNS, 1925.

Railways	Aggregate to October 25th						Increase or decrease
	Passengers, parcels, etc., and mails		Merchandise and live stock		Total		
	1925	1924	1925	1924	1925	1924	
Great Western	£11,725,000	£11,787,000	£13,860,000	£14,548,000	£25,585,000	£26,335,000	— £750,000
London, Midland & Scottish	27,864,000	28,159,000	36,201,000	37,307,000	64,065,000	65,466,000	— 1,401,000
London & North Eastern	19,345,000	19,629,000	28,334,000	29,260,000	47,679,000	48,889,000	— 1,210,000
Southern	14,830,000	14,800,000	5,028,000	5,030,000	19,858,000	19,830,000	+ 28,000

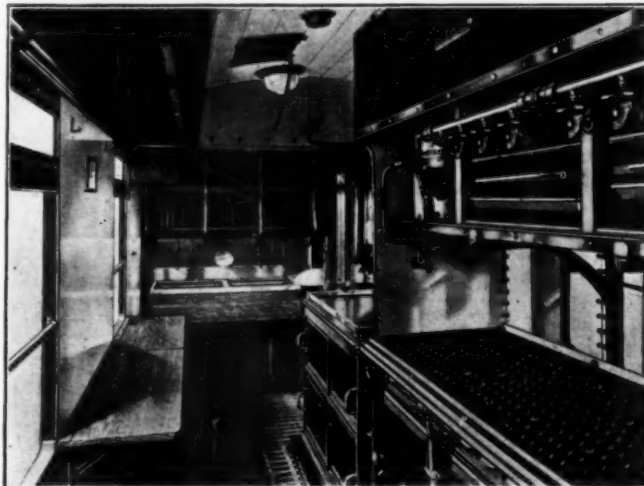
made its first journey on September 27, 1825, was drawn by Stephenson's engine "Locomotion" under its own steam. Included in the procession was also a tableaux train comprising incidents covering every period of British railway history with appropriate costumes. The 12-mile route was lined with thousands of cheering spectators, and there is little doubt that the centenary has had the effect of greatly popularizing rail traffic.

The International Railway Congress which was attended by many prominent American railroad men held a successful session from June 22 to July 7. An immense amount of useful work was accomplished by the delegates, the lighter moments being spent in strenuous pleasures combined with instructive sight-seeing. The proceedings culminated in a banquet at the Crystal Palace in which nearly 1,400 guests took part.

An event which captured the imagination of the public was a trial of strength between the express passenger locomotives of the London & North Eastern and Great Western companies. One of the former company's latest Pacific type engines was allotted the task of hauling the Great Western's "Cornish Riviera Express" from London to Plymouth, which is the longest daily non-stop run in the world, whilst the Great Western engine "Pendennis Castle" worked the 10.10 a.m. London to Leeds express.

The exchange was made for no other purpose than the gathering of data relating to fuel and water consumption to ascertain which type of locomotive was the more economical; but judging by the enormous interest which the public manifested in the trains all along the route, it was evident that they imbued the trials with something more than scientific interest. The trials were for the period of a week, and to properly compare the behavior of the exchanged locomotives, their performances were matched on alternate days by a train of the same weight being drawn by an engine of the company over whose lines the "foreign" engine was being run, e.g., the Great Western "Cornish Riviera Express" drawn by a London & North Eastern engine on Monday, Wednesday and Friday was matched by a "Castle" type engine of the

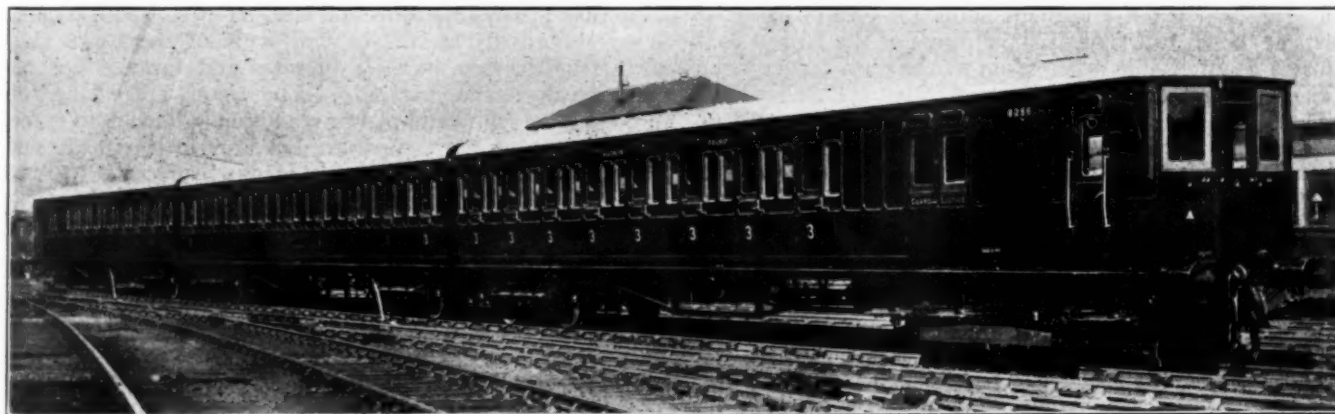
Eastern side of England, and the directorate has boldly faced the problem of its economic transportation by planning an electrification scheme at a cost of some £5,500,000. The first section, comprising 82 track miles, was opened on April 1, 1925, and is constructed on the single-phase alternating current overhead system. The remaining sections now under construction and to be



Interior of Kitchen Car, L. M. S.

completed early in 1926 will be on the direct current third-rail system.

In the midst of all this work, which was designed to convert a war-worn railway into a first-class undertaking, a curious situation arose. The Southern Company had to face one of the most virile press attacks suffered by any railway. From a tiny speck grew a veritable mountain of abuse, until almost every newspaper in the Kingdom had something unpleasant to say on the subject. It was when the storm had reached its height that the Southern management got busy and launched a press campaign to



Multiple Unit Electric Train for the Southern, South Eastern Section

Great Western taking the same train on Tuesday, Thursday and Saturday, and the same on the other line.

The Year's Developments

Some very important development work was carried out, but generally speaking 1925 was not remarkable in extensions, which is hardly to be wondered at in view of the problems affecting the maintenance of traffic which British railways had to face.

A work of great public interest and utility was the electrification work of the Southern Company. This railway carries a very heavy suburban traffic from the South-

show that the railway which had borne the brunt of the war traffic was "actively engaged in the public service." The fact that it has been as good as its word has had the effect of restoring public confidence, and giving the Southern its deserved position in the "big four," as the railway groups are popularly called.

Another work of importance, although of comparatively small dimensions, is the new line opened on November 2 by the Metropolitan and the London & North Eastern jointly. This link, 2½ miles long, affords an electrified service from stations in the City of London to Watford, a growing town 18 miles from the Metropolis. One of

the most interesting features of the new line is that it enables 140 through trains to be run daily, the trains being divided about equally between the two companies. Its construction cost £300,000 and entailed the excavation of half-a-million cubic yards of gravel and chalk and the building of numerous embankments, bridges and freight yards.

The most valuable contribution in recent years to the South Wales coal industry has been the policy of the Great Western Railway Company in adopting the 20-ton* all-metal car as a standard for the conveyance of coal, and of its offer of substantial rebates in the shape of trans-



Tipping a 20-Ton Car Over a Belt Conveyor, Port Talbot

port, dock, etc., charges to traders willing to use them in place of 10-ton cars.

Heavier Coal Cars

Coal cars in England are nearly all privately owned and it will be realized that it was no easy task to induce firms whose equipment was designed to take cars no larger than 12 tons, to adopt a new standard which meant altering their tips. In addition the Great Western Company had to lay out enormous sums for converting coal hoists at the docks. The fact that some of the largest coal firms in South Wales have taken to the high capacity car is evidence that its economic potentialities are realized.

The L. M. S. Company has carried the development of passenger rolling stock a stage further by placing orders for a large number of coaches, the frames and bodies of which are constructed entirely of steel built in one unit, necessary timber for fittings and linings being made of a special and practically non-inflammable wood. This company has also put in hand the construction of a large number of locomotives of improved type.

The London & North Eastern has been the first British railway to adopt a type of locomotive with which readers of this journal are already familiar—the Garratt six-cylinder. This engine is in service for helper service on coal trains on a heavy-grade line in Yorkshire, and in a loaded condition weighs just over 178 tons. The distribution of this weight works out, however, at only $2\frac{1}{4}$ tons per foot run of wheel-base, and the maximum load on any one axle is under $18\frac{1}{2}$ tons.

To the Southern Company, whose resources were so severely taxed by the exigencies of the war, owing to the fact that practically all traffic destined for the Continent had to pass over that railway, must be given credit for the greatest development effort. Apart from the electrification work, previously mentioned, orders for new rolling stock, station reconstruction, etc., have been placed by them to the value of some £10,000,000.

* Long tons of 2240 lb.

Irish Railways

Table B indicates an unfortunate state of affairs in so far as the railways in Ireland are concerned. Those in the Free State have suffered particularly. Amalgamation of 28 independent companies was made compulsory by the Free State Railways Act of 1924, and it may be taken that it was justified inasmuch as the total mileage of these lines is but 3,400. Since that date matters have gone from

TABLE B.—IRISH RAILWAY STOCKS AND SHARES.

Railways	Stocks	Highest 1924	Lowest 1924	Price Oct. 28, 1925
Belfast & County Down....	Ordinary	84½	59½	24
Great Northern	Ordinary	67½	54½	28½
Great Southern	Ordinary	39	35	17½
-do-	Preference	51	50½	23½
-do-	Guar.	57½	56	41
-do-	Deb.	69½	65	55

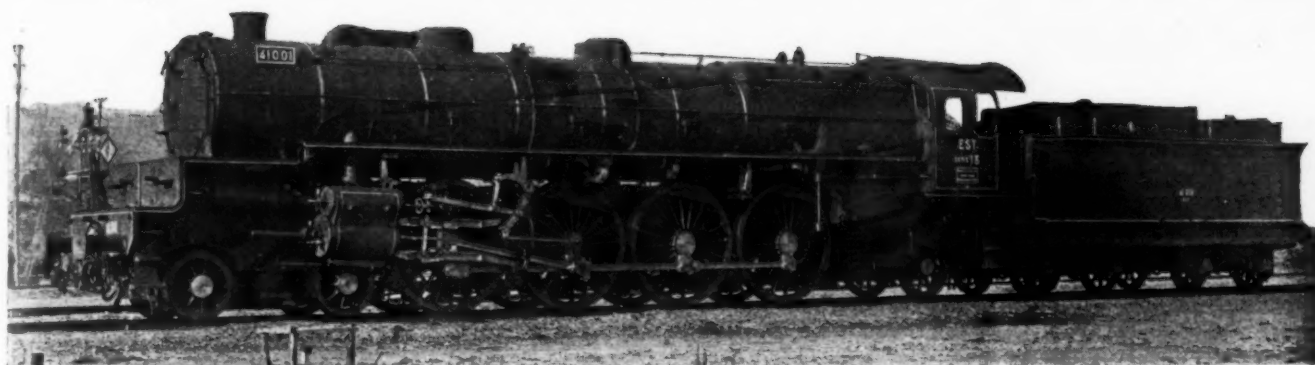
bad to worse, and the position today is that the Free State railways are unable to pay any dividends on any stock below the guaranteed preference. As in the case of the English railways, wages are far in excess of what the industry will economically bear, but this item is not wholly responsible for the adverse conditions. Contributory factors were a decrease in the export cattle trade, a bad tourist season in 1924 (happily much improved in 1925), exceptionally bad trade, and competition in motor traffic. A large number of wage earning investors, besides charitable institutions, have been hard hit by the depreciation of stocks. The directors sought to stay the downward trend by asking the staff to accept a voluntary 5 per cent decrease in salaries and wages, they themselves leading the way with a reduction in fees on a much higher scale, but the scheme was rejected.

Two British railways, the Great Western and London Midland & Scottish, are uniting in a special effort to help the Irish railways and there is every prospect of a brighter tourist season for 1926.

The Outlook

Conditions in regard to labor have been easier during 1925 than at any time since the war, but wages still remain at an abnormally high level, 153 per cent above pre-war, whilst the average increase in rates and fares is but 50 per cent above the year 1914. The unions are asking for more still, which would place an additional burden of some £45,000,000, on the companies, but they in turn have put forward proposals for reducing wages by from 4s. to 6s. (\$1 to \$1.50) per week. The issue will be decided by the National Wages Board, the final arbiter in all disputes. In an article entitled "What Does the Future Hold for the Railways?" Sir Felix Pole, general manager of the Great Western, optimistically expresses the view that the answer is "Prosperity". Amongst the various conclusions leading him to this opinion he states:

"Last, but by no means least, I look to increasing recognition by the huge army of 700,000 railwaymen of the fact that their livelihood depends upon co-operation with the management in effecting all possible improvements and the reduction of costs to meet competition. (A kindly state does not provide, maintain and police a road for a railway.) It is useless for employees to talk of still better conditions of service, or, indeed of retaining their present greatly improved wages and hours if the industry cannot bear the cost. They must realize—as experience in the United States has shown—that it is only where there is no restriction of output, free use of labor-saving appliances, and a high standard of individual efficiency that high wages can be paid. Labor is beginning to realize that high wages, short hours, inefficiency and restriction of output cannot exist together."



A new Locomotive on the Eastern Railway

1925 a Disappointment to France

Year started favorably, but business slump brings deficits, a third of which arise from low commutation rates

By M. Peschaud

THE work undertaken by the railways of France since the end of the war to increase the safety of operation has been kept up during 1925. Among the technical improvements is included the extension of the block-system to such lines as were not provided with it, and to the application of cab signals on the locomotives; also the installation of telephone train dispatching to a given number of heavy traffic lines. At present, the length of lines over which the dispatching system is used is over 2,500 kilometers (1,550 miles). On the Eastern system, in particular, 876 km. of telephone lines have been placed in service.

Systems	January 1, 1925		January 1, 1914		Increase %
	Steam	Electric Motor cars	Steam	%	
Northern	3,003	..	2,350	28	
Eastern	2,397	..	1,899	26	
P. L. M.	5,153	..	3,560	45	
P. O.	2,716	28	19	23	
Southern	1,224	48	57	15	
Alsace-Lorraine	1,772	..	7	53	
State	4,118	17	100	44	
Total	20,383	93	183	36	

In the early part of 1925, the Eastern Company undertook tests with a new locomotive which was built in its Epernay-Magenta shops (see accompanying illustration). This locomotive, which is the most powerful, not only of France but also of the European continent, is going to be used on the fast trains of the Paris-Strasbourg line. It is a mountain type locomotive, 52 ft. long (82 ft. with the tender), and weighs over 100 metric tons. Under tests which were made the locomotive traveled from Epernay to Châlons and return at an average speed of 74.5 miles an hour.

Systems	Jan. 1, 1925		Jan. 1, 1914		Increase
Northern	94,065	81,029	16%		
Eastern	83,384	60,734	37		
P. L. M.	129,180	105,568	22		
P. O.	62,473	46,237	35		
Southern	33,088	30,107	10		
Alsace-Lorraine	47,657	29,628	61		
State	87,049	61,606	41		
Total	536,896	414,907	29		

Technical Improvements

In order to cut down maintenance expenses the companies have pushed very actively the application of steel frames to cars of old construction, with either wooden or combination bodies.

The total number of passenger cars on line declined from 36,021 in 1924 to 35,855, in 1925—the slight decrease arises from the scrapping of such cars as no longer met the requirements of present traffic. Besides, passenger traffic has not increased enough to demand more cars.

The replacement of gas lighting by electricity in so far as cars which are likely to be used in fast trains are concerned, has been completed. The equipment using gas is no longer used, except at exceptionally crowded times, and only on notice given by the companies to the supervision department.

The radiophonic communication tests, begun in 1922, on trains in operation have been pursued with success. Refrigerator car service continues to progress. The number of such cars has jumped, taking all the companies together, from 221 in 1919, to 2,300 in 1925.

	1923	1924	1925
January	55	57.9	61.3
February	54.4	61.6	63.3
March	56.9	63.2	63
April	54.9	59.1	59
May	54.2	59.7	59
June	56.7	59.6	59.7
July	55.1	58.7	58
August	55	60.3	60.1
September	57	62.8	64

In order to insure the safety of trains in a more efficient manner, the management of the "Sureté Générale" (board of control) has organized a body of special inspectors, divided among all the companies.

Regarding the matter of baggage insurance, the French railways have passed an agreement with the "l'Européenne" Insurance Company to take care of insuring baggage, either for one trip only, or for a period of stated duration. On a single trip the premium varies according to the distance traveled. On successive trips, the traveler can insure his luggage, by means of policy good for 60

days, by paying a premium of 15 francs per 1,000 francs of the value insured.

Construction Work Projected

The State Railway is preparing to rebuild the Saint-Lazare and Montparnasse stations at Paris and contemplates erecting a monumental station at Havre. The Orléans Company is enlarging the Austerlitz station at Paris, which will be provided with 21 station tracks, instead of 9, and it has started the construction of a new station at Limoges. The Eastern Company has decided to enlarge its Paris station. On the Northern System, the Longueau terminal (near Amiens) which played such an important role during the war, has been enlarged to the point that it has become a trans-shipment station of the first magnitude. In order to take care of the freight traffic of the port of Dunkirk, which is increasing constantly, the company has built, right in the harbor, a large yard which brings Dunkirk to the rank of one of the best equipped ports, in so far as communications by rail are concerned. The P.L.M. Company is undertaking extensive building operations for the purpose of relieving the congestion of its Paris terminal. At Lyons important work is under way. At Nice the transformation of the terminals is almost completed. At Grenoble, owing to the "White Coal" and Touring exhibitions, which were held there in 1925, the station was enlarged and considerably improved. At Marseilles, the company is enlarging the station and its approaches.

Electrification

The Southern, the P. L. M. and the P. O. have started putting into execution vast electrification programs, which cover about 5,500 miles and involve an expenditure of over 5 billion francs. The carrying on of these programs has been pursued during the year 1925.

On the Southern, particularly, which is to electrify 3,200 kilometers of its entire 4,160 kilometers of line electric trains are already running on several sections; the number of electrified sections will be increased shortly.

The State System has actively pursued the electrification of its suburban lines. The installation of 350 kilometers of high tension cables, necessary for complete electrification is finished. Five of the 12 substations needed are built.

New Lines

Independently of the improvement of existing lines, the construction of certain new lines has been pushed forward or started, notwithstanding the increased cost of materials and labor. The Eastern in particular is pursuing the construction of several lines destined to insure more direct connections between this system and that of the Alsace-Lorraine, through the Vosges mountains. On the P. L. M. important work is being done, to improve the movement of trains on both banks of the Rhône river. On the Southern, the construction of three Trans-Pyrenean lines is progressing.

Operating Results

The operating results achieved are as follows: While 1924 closed with a deficit of 493 million francs, the year 1925 closed with a deficit of over 700 million francs. As in 1924, two of the systems, the Alsace-Lorraine and the Eastern, showed an increase; unfortunately the other five continued to show a deficit.

The increase of the deficit is due, notwithstanding the energetic policy of economy and the raising of rates, to the new regulation, to the eight-hour day, to certain income decreases, but above all to the slowing down of traffic, caused by the stagnation of business.

Rates

The increase of wages, which became operative on January 1, 1925, and of which we shall speak later, has entailed an additional expenditure of over 900 million francs. A correlative increase of rates was put into force, starting from the same date. The general increase in freight tariffs in their relation to base tariffs was carried on that date from 170 per cent to 190 per cent, exception being made in favor of perishable foodstuffs, fertilizers and newspapers. In certain instances arbitrary charges which appeared to be excessive, particularly in the case of short haul transportation, led to a decision to modify these charges. In order to compensate for the decrease arising from the revision of tariffs on these charges, the general freight rate increase was carried to 200 per cent on March 10, 1925.

But various commodities still escaped these increases, namely parcel post packages, which enjoy a privileged status, causing a loss of about thirty million francs; and, commutation rates, which cause a deficit of 240 million francs, that is to say, about the third of the total deficit of the companies. In vain, so far, the companies have asked for increases in these rates. In spite of these increases, due to the decline in value of the franc, rates are on a gold basis much lower than before the war, i.e., on November 25, 1925, they stood at from 50 per cent to 54 per cent of pre-war for passenger service and at 78 per cent for freight.

Labor

The average number of employees of all the systems is about 500,000. The total labor expenditures for staff in 1925, reached 5,516 million francs, or 52 per cent of total expenses. The average earnings per employee is about 11,000 francs.

The wage increase, which was granted in 1925 was as important as that which the government had contemplated in favor of civil servants, but which it has not, as yet, put into force. The indemnity which was granted during the war to offset the high cost of living, and which was raised on several occasions, has been cancelled, and it has been replaced by an increase of salary varying between 30 per cent and 15 per cent of the salary earned, according to classification, being smaller for those with larger salaries. The residential indemnity has been considerably raised, and for Paris in particular, it has been increased from 1,440 francs to 2,400 francs. The allowances for family incumbrances have been discontinued, in view of the residential indemnity.

The Eight-Hour Day

We have stated that to new burdens which have been placed on the companies, on account of wage increases, have been added those which are the outcome of the new application of the eight-hour law to the railways. The revision of regulations covering the work performed by the enginemen, firemen and trainmen is still being considered.

Regulations for other railroad workers were modified on January 16, 1925. The new regulation is ever so much more restrictive than was the one which was brought into force under the decree of September 14, 1922. Two years ago we had occasion to state that this decree strictly conformed with the law of April 23, 1919, as far as the eight-hour day was concerned, i.e., it took as a basis for figuring the period of work *actually* performed over the entire year. This period could not go beyond 2,504 hours. It anticipated that the duty service time might be extended 450 hours per year through overtime. But under no condition could the time of mere physical presence on the job be considered as actual work performed. The new regulation cuts down to 2,384 hours the annual

total of actual work owed by the employee, and to 75 hours the overtime permitted. This bulk time can be increased but by 100 hours, under exceptional circumstances, and upon a permit granted by the Minister of Public Works. Consequently, the maximum period for labor which the companies can demand of each one of their employees is thereby cut down about 400 hours per year per man, or, taking the 300,000 employees included in the decree in consideration, this brings the total to 120 million man-hours. In order to make up this decrease of working hours, the companies have been compelled to hire about 5,000 new men. The length of work actually performed is no longer figured on a full year basis; it is now figured over a much more limited period of time, varying between 10 days (for the employees of the operating department) and 90 days (for those belonging to the track department). The new regulation allows for physical presence on the job, which can be calculated as actual work performed. Difficulties which the application of the new decree raise will be settled by the Minister of Public Works under advice from a tripartite commission composed, in equal number, of members representing the administration, the companies and the employees.

Without taking a real interest in the employees, and without decreasing in a noticeable measure the claims presented by the unions, the new decree has created a new deficit in the budgets of the companies. Some of its clauses appear to be clearly contrary to the law which created the eight-hour day, and the companies have appealed to the Council of State, against this decree.

Reinstatement of Dismissed Employees

We mentioned last year that, following the law of amnesty which was voted by the new Chamber of Deputies, the government urgently requested the companies, that they reinstate the employees who had been taken off the rolls at the time of the 1920 strike.

In view of the agreement concluded with the head of the government, on October 30, 1924, which agreement we explained at length in a previous article, the companies considered and granted the applications for reinstatement presented by the employees dismissed at the time of the 1920 strike, in a manner compatible with efficient operation.

Up to October 1, 1925, 6,200 applications for reinstatement were presented by part of the 18,200 men who were discharged; 3,788 (or 61 per cent of the applications, and 20 per cent of the dismissals) were given satisfaction. Particularly on the State Railway the reinstatements have been numerous, where they reached, with a few exceptions, the number of applications which were handed in.

In spite of these concessions granted by the companies, Premier Herriot's government thought it proper to present

a law draft "having for its purpose the submission to the approval of the government the appointment of members of the management committee of the leading railway systems, and of the high officers of the railway companies."

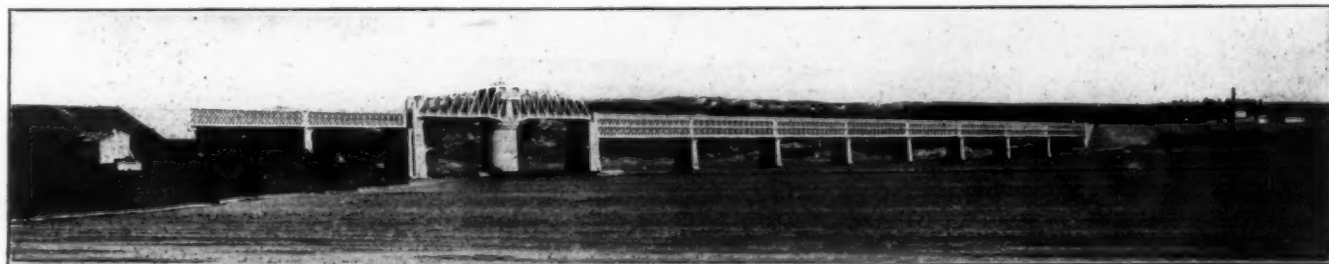
This draft, which is contrary to the letter as well as to the spirit of the convention of June 28, 1921, instituting the new status of French railways, and to the by-laws of the companies as approved by the state, has raised loud protests in commercial, industrial and agricultural centers. Without withdrawing it, the last two ministries have taken no steps to bring it to a vote. It has not yet been reported upon by the committee of the Chamber of Deputies entrusted with its consideration.

The Outlook

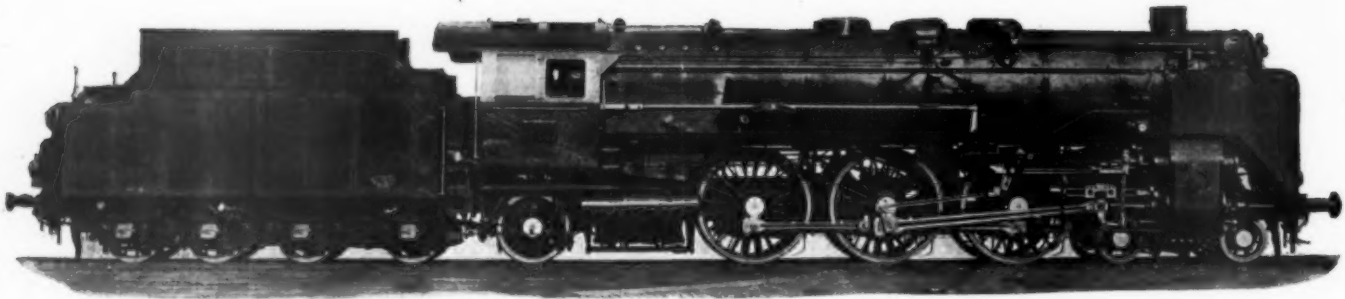
Taken as a whole 1925 began under rather favorable auspices, it was expected that at last, receipts would balance expenditures. But the slump in traffic which occurred, added to the other causes which we have enumerated, turned this balance into a 700 million deficit. In view of the fact that 1926 is to be burdened with an additional expenditure of 250 millions, due to the increase in financial disbursements, the companies have requested to be authorized to raise their rates. The general raise of passenger schedules would be carried from 150 per cent for the third-class, 160 per cent for the second-class, 170 per cent for the first-class, as at present, to 190 per cent uniformly. Freight schedules would be brought from 200 per cent to 230 per cent. On the other hand, the companies have once more asked that the scale covering the parcel post packages and suburban tickets be raised.

If these various increases are authorized, a balance of the companies' budgets may be arrived at in 1926, provided that the drop of French currency does not come to disturb the expectations of these systems, by causing an increase in the cost of living, necessitating a new increase in wages and making the disbursements heavier.

If, technically speaking, operations are satisfactory, now the financial future must be considered, not in a pessimistic mind, but with deep attention. The enforcement of the new status has had happy effects for the national Treasury, whose burdens it has alleviated, but owing to the economic and financial difficulties which France is experiencing, the companies have not yet been in a position to reach normal conditions, and in 1925, the same as for the past three years, they will have to call upon loans to meet the additional income required to carry out their financial obligations. It will be recalled that these loans are contracted for by the companies on account of the national Treasury, since up to 1927 it is the state which must bear the deficits of the systems. From then on rates will have to be placed on a level with the expenditures of the systems, the state ceasing to make good their deficits.



A Bridge on the P. L. M.



4-Cylinder, Superheated Pacific Type Locomotive, Built by Henschel

The German "Reichsbahn" Under the Dawes Plan

Is making good its obligations and will continue to do so if business improves

By Dr. Alwin Sperber

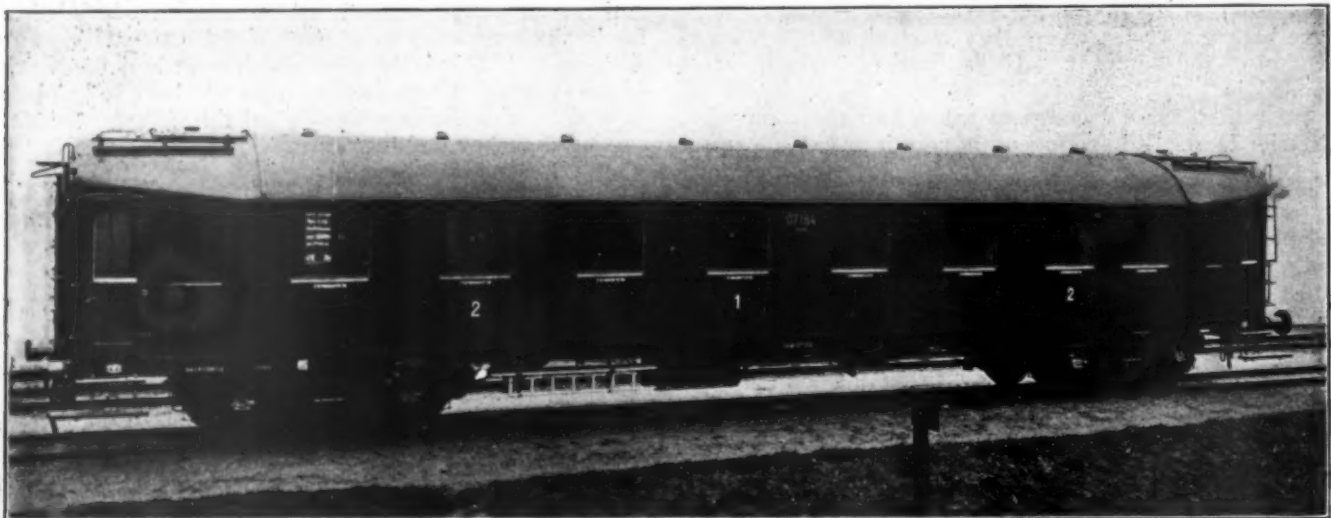
BY the time of publication of this article, the railways of the German Reich will have concluded their first year of operation under the administration of the "Deutsche Reichsbahn Gesellschaft" (i. e., the German State Railway Company). The reorganization should be of interest in the United States, inasmuch as it constitutes a part of the realization of the Dawes Plan, in which the railways of the Reich are considered as a particularly important factor in meeting reparation payments. Furthermore, administration by a company operating on business principles for a profit will attract all the more attention in view of the fact that, heretofore the railways were operated on a purely governmental basis.

No Longer a Government Enterprise

There has, in fact, been a material change, although not to such an extent as foreign observers may readily be led to believe at first glance. Under government management the factor of earnings was considered less important than

service for the economic life of the country. This appears from the rate policy which was designed to support the commercial policy of the Reich; as well as from the construction policy, which led to the building of railways in places where there was not as yet any chance of their being a paying investment, but where agricultural or industrial production had in the first place to be promoted by the building of the railway.

The factor primarily considered in the reorganization under the Dawes plan is earnings. The Reichsbahn-Gesellschaft is compelled to devote its attention in the first place to the setting aside of the reparation amounts due—the more so in view of the fact that under the provisions of the "Reichsbahn Act" of August 30, 1924, there would in case of failure be danger of a weakening, or even a complete loss, of German control of the administration. The law also provides, however, that the company shall manage its operations with due regard for the interests of German economic life. Nevertheless, it is



A German Steel Frame Through Passenger Car

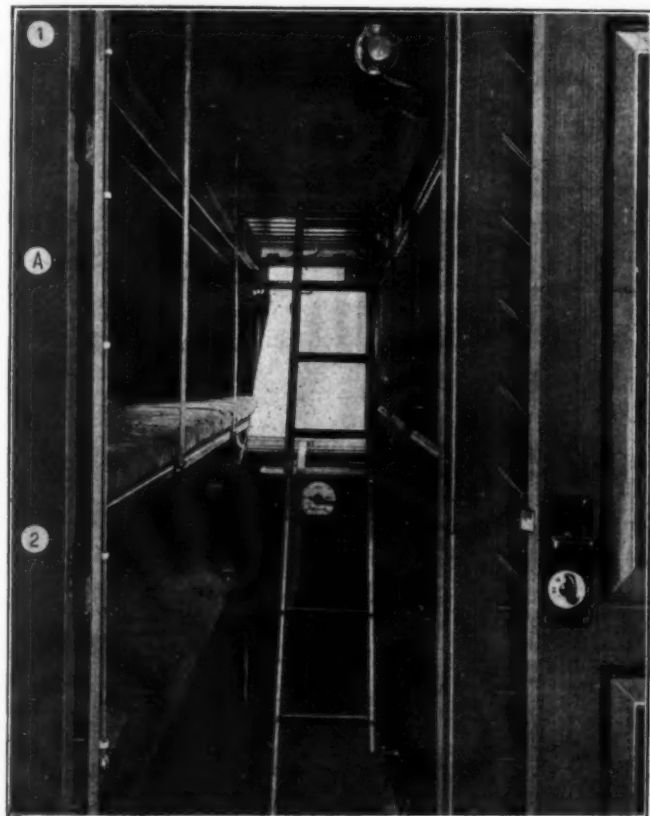
evident that the absolute necessity of securing revenue, particularly in the present economic condition of Germany, prevents the railway company from serving the interests of German national economic life to even approximately the same extent as the railways were able to do in happier times. This has already become apparent in the course of the first business year in connection with the closing of repair shops and the refusal of all applications for the reduction of rates.

The foreign experts, and more particularly the Englishman, Sir William Acworth, were of the opinion that businesslike management could be secured by forming a corporation independent of control by Parliament. The Reichsbahn-Gesellschaft, established in realization of this conception, is nevertheless not absolutely a private corporation. Ownership has remained vested in the Reich. The company merely operates the railways in its own

and railway problems. The board of managers is made up of a general manager and of one or more managers, all of whom must be German citizens. The general manager is elected for a term of three years by the board of directors, by a majority of three-fourths of the votes cast. The managers are likewise appointed by the board of directors, upon motion of the general manager.

What the Reichsbahn Must Do

The experts, Sir William Acworth and M. Leverve, in conformity with whose arguments the Dawes plan was



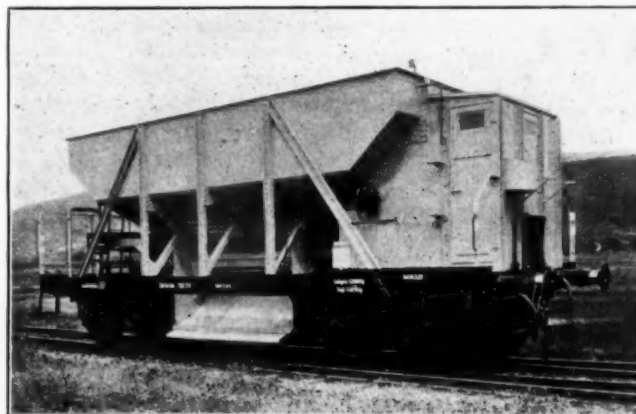
Compartment in a Third-Class Sleeping Car

No bedding furnished. By day the compartment provides seats for 3 passengers. The car, of steel frame construction, has 12 such compartments, in addition to wash room facilities.

name for its own account to a certain extent as trustee for the Reich until reparation obligations are discharged.

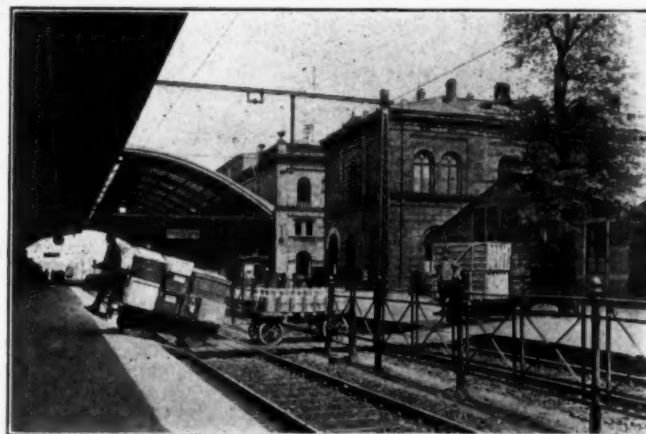
Management of the Company

The management of the company is invested in a board of directors and a board of managers, there being no stock holders in the usual sense of the term. The company is consequently not a regular corporation. The board of directors is made up of 18 members, one half of whom are appointed by the government and the other half by the reparations trustee, who is the representative provided by law for the creditors on account of the reparation bonds. In case of a tie, the chairman, who must be a German citizen, has the deciding vote. Of the members of the board to be appointed by the trustee, five may be German citizens, as is actually the case at the present time. All members must have knowledge of economic conditions



A Hopper Car of 42 Metric Tons' Capacity Equipped with Roller Bearings

drawn up, assumed on the basis of various considerations, among which was the surplus of about one billion marks earned by the German government railways during the last years before the war, that the capital invested in the German railways, or more correctly the value of the operating right to be transferred to the Reichsbahn-Gesellschaft, amounts to 26 billion marks. Furthermore, it was assumed that the pre-war debts of the German railways had become of no importance in consequence of the inflation, and could be completely eliminated from the



Storage Battery Trucks in Baggage and Express Service, Magdeburg

economic status of the Reichsbahn-Gesellschaft. Against this assumed value of 26 billion marks was figured a capital stock of 13 billion marks in shares of common stock, and two billion in shares of preferred stock as well as an additional charge in the form of bonds of a total face value of 11 billion. The shares of common stock were issued to the Reich and are really no shares at all, inasmuch as they will become worthless when the operating right reverts to the Reich, upon payment of all the repara-

tions. It is unlikely that they will ever be issued. They do not carry the voting privilege; they merely give a claim to dividends, which, however, is practically worthless for any measurable time. Of the amount realized by the issue of the preferred stock, 500 million marks are to be allotted to the Reich, while the balance of 1½ billion marks is to be allotted to the Reichsbahn-Gesellschaft for the purpose of providing capital for investments. Up to the present

tax, estimated for the year 1926 at 250 million and thereafter at 290 million marks as a reparation payment. This sum, however, is merely a matter of passing cash, although it is a factor of importance in the tariff policy of the Reichsbahn.

For the first three years (ending August 31) the annual amounts to be set aside for interest and redemption of debentures is to be 200 million, 595 million and 550 million

	Results in 1913 (Not Including Surrendered Territory)		Expected Results in the Business Year 1925 (1¼ yrs.)	
	Million Marks	Per Cent of Revenues or Expenditures	Million Marks	Per Cent of Revenues or Expenditures
A. Revenues				
1. Passenger and baggage Traffic.....	904.0	29.57	1,749.0	31.53
2. Freight Traffic	1,927.0	63.03	3,506.0	63.08
3. Other Revenues	226.7	7.40	299.7	5.39
Total	3,057.7	100.00	5,548.7	100.00
B. Expenditures				
		With Debt Service		With Debt Service
		Without Service		Without Service
1. Labor (including the wages of the railway maintenance and shop work)...	1,350.2	50.84	3,062.0	65.43
2. Material Expenditures (not including debt service).....	855.0	32.20	1,584.7	33.86
Total	2,205.2		4,646.7	
Operating Ratio		100.00		100.00
3. Debt Service	450.3	16.96	33.0	0.71
Total	2,655.5	100.00	4,679.7	100.00
4. Special Expenditures	294.0		358.0	
Surplus				
To be Used as Follows:				
1. Service of the Reparation Bonds	108.2		511.0	
2. Compulsory Reserve			400.0	
3. For General Government Purposes	108.2		111.0	

time no shares of preferred stock have been issued in view of the condition of the money market.

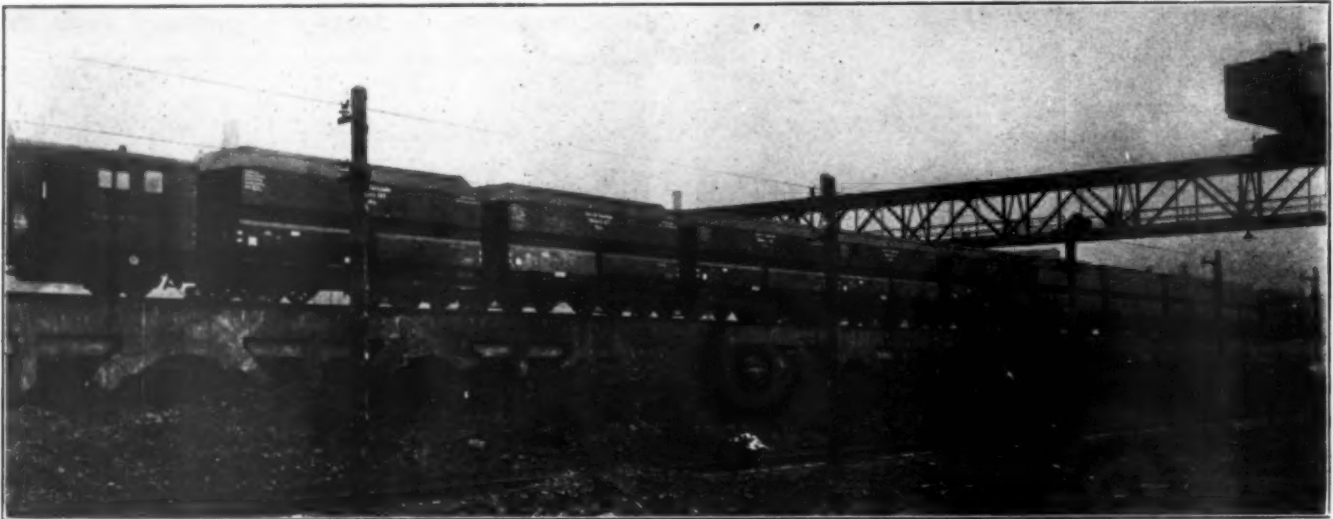
Annual interest at the rate of 5 per cent is to be paid on the bonds and 1 per cent must annually be paid to the sinking fund, and they consequently place annual charges of 660 million marks on the railways. These payments represent the reparations burden proper, to which will be added later on dividends on that part of the shares of preferred, the proceeds from which are not intended, as

marks. The Reichsbahn-Gesellschaft had consequently to provide in its first year for the first reparation year (from October 1, 1924, to August 31, 1925) and one-third of the second reparation year, to wit:

Service of reparation indenture.....400,000,000 marks
Compulsory Reserve Fund.....111,000,000 marks

Total511,000,000 marks

Taking this statement into account there was drawn up



Unloading 50-Ton Cars—Time Required, 8 Seconds Per Car

above explained, to redound to the benefit of the Reichsbahn-Gesellschaft.

Moreover, the company is compelled to set aside annually 2 per cent of the receipts until a reserve capital of 500 million marks is accumulated. This consequently constitutes a further burden of about 110 million marks for the first business year.

Furthermore, the Reichsbahn-Gesellschaft pays over to the reparations agent the proceeds of the transportation

a preliminary estimate for the year 1925, shown in the table in comparison with the results of 1913 (exclusive of the sections of railway now located in the surrendered territories).

Difficulties Encountered

The task of adhering to this preliminary estimate during the first business year was rendered materially more difficult for the company by various circumstances. Large

amounts had to be expended, for instance, for the reconstruction of the Rhine and Ruhr sections, which had suffered very seriously from the French and Belgian invasion of the Ruhr district and foreign operation. For repairing this damage alone an expenditure of 100 million marks was required in the year 1925.

Furthermore, the Reichsbahn-Gesellschaft was and will likewise be hereafter compelled to pay considerable amounts for pensions and unemployment doles for employees who were affected by the large reduction in forces which was already effected materially before the operating right of the Reichsbahn-Gesellschaft came into force. After the armistice the Germany railways, being forced to do so in view of the demobilizing operations, hired employees far beyond their economic requirements, with the result that for the present system of the railways of the Reich, the total number of employees, viz. 693,000 in the year 1914, was increased to more than 1,000,000. Although the number of employees has now decreased to about 765,000, the Reichsbahn-Gesellschaft nevertheless has to take care of large numbers of employees who have to be laid off, and who under normal economic conditions would never have been allowed to enter the service of the German railways, and whom the railway company must now either pay a pension or unemployment doles amounting to as much as 80 per cent of their wages. The weight of this burden is plainly illustrated by a pension and dole account which amounts to 400 million marks.

Highway Competition

The development and extension of motor car traffic, which set in to a very noticeable extent last winter, has deprived the railways of a by no means immaterial amount of traffic. Motor car connections between the seaports of

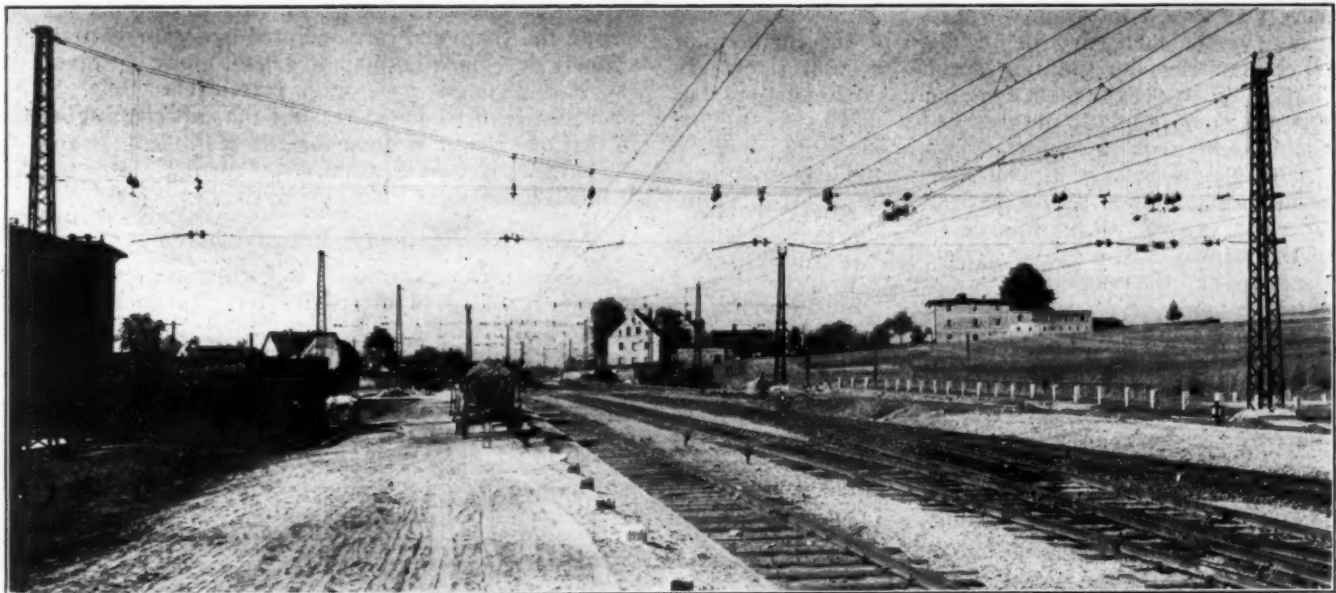
Improvement in Railway Service

To meet the competition of the motor trucks in freight traffic the railways offered with their summer schedules generally and materially faster freight and express service. The speed of freight trains was increased to 25 M. P. H. and that of express trains to 37 M. P. H. Particular attention was given to quicker handling at yards and to perfectly smooth transportation on important traffic routes. Changes in express service amounted to a complete re-organization of the business. A system of through trains was established and their time of departure and arrival at important centres was made as favorable as possible. In connection with these fast freight trains, a connecting system of near-express freight trains was installed. In the express freight service for instance, the fast freight trains runs were reduced on the line:

Hamburg-Cologne	to 12½ hours
Berlin-Cologne	to 15 hours
Bremen-Bale	to 35 hours
Hamburg-Bale	to 37 hours

By means of such measures considerable motor truck traffic has been recovered by the railway. Furthermore, the Reichsbahn-Gesellschaft is co-operating with a number of the larger highway traffic concerns by means of contracts providing that the latter shall not establish routes parallel to the railway lines but, on the contrary, that they shall deliver freight to the railway. In return, there is allotted to them in large cities having numerous freight stations, such as Berlin, Munich, and Leipzig, the carrying of freight between stations whenever rail traffic between such stations would be roundabout and uneconomical.

In all other respects business was conducted last year



Electrified Line, Hirschberg (West Station), Silesia

Hamburg and Bremen and large business centers such as Berlin, Hanover, Leipzig and Dresden were organized. The motor truck also deprived the railway of freight for short runs. The development of this traffic has been favored by the fact that the taxation of motor trucks for road building and maintenance has been wholly insufficient, notwithstanding the very heavy wear on the highways caused by this traffic. Some of the motor trucks could undertake to carry freight at lower rates than the Reichsbahn-Gesellschaft.

with a view to the greatest possible reduction in forces and purchases and to the opening up of sources of revenue not as yet utilized. In view of the fact that in consequence of the difficulty of securing credit, all expenditures having to be defrayed out of the current receipts, the greatest economy was required in all departments of the business. Even comparatively small new installations, for improving operation could be provided only to a limited extent, even if it could be proved that such installations would prove very profitable.

Standardization an Important Part of Program

Furthermore, an attempt was made to reduce all operating and shop expenses by applying to a greater extent scientific methods. Important improvements have been made in the course of the last few years in shop organization and the work is proceeding. Many shops which had become obsolete were closed down and the work concentrated elsewhere. Shops were restricted to the types of equipment which they could adequately handle. Plans for standardization of parts to permit large scale manufacture have progressed far. Many spare parts are manufactured semi-finished, which with some small local finishing work can be used in connection with several types of rolling stock. The success has been enhanced by the fact that the shops are no longer simply parts of the railroad but are independent units which make direct accountings with the individual railroad managing offices whose orders they execute on basis of their cost prices.

The Freight Rate Problem

In its endeavors to increase the revenues, the company has been greatly limited by the prevailing conditions. In view of economic conditions, an increase of the most important source of revenue, i. e., freight rates, could not be contemplated since the rate index when compared with the status of the year 1913 and taking into consideration all the special tariff rates showed 143, i. e., an increase of 43 per cent. Although the ratio between the present freight rates and those charged in pre-war times is still more unfavorable than this in some neighboring countries, it must be borne in mind that the average transportation distance is greater in Germany and that therefore, even if the index figure is comparatively lower, on a ton-mileage basis the actual freight charges in Germany are felt more heavily than in neighboring countries. Furthermore, the company was forced to regain through traffic, which it was losing by the increasing depreciation of the currency of other countries, by granting special through rates. In May, 1925, passenger rates were increased 10 per cent, but this was done simply to meet expenses which came up and could not be avoided—especially wage increases.

The other sources of revenue lying outside of the range of the transportation proper have been increased to a considerable extent. In accordance with a special provision of the railway law, services rendered by the company for the states and the municipalities, contrary to former usage, must be paid for at customary rates. Furthermore, all revenues which the company derives from the renting and lease of storage places, for services in connection with the maintenance of private sidings, from the granting of underground or overhead crossings or other privileges must be paid for at regular prices. Finally, the numerous accessory enterprises, as for instance, railway restaurants, magazine stands, the lease of advertising space in railway stations and in trains, slot machine, etc., have been taken advantage of to an increasing extent.

Technical Progress

In view of the present conditions it has not been possible to proceed with the carrying out of technical improvements at the same speed as would have been the case otherwise. Nevertheless, all the progress made in technique has been carefully examined with a view of making the most promising changes. Electrification has progressed, although only within moderate limits. The work was undertaken only where it was clear that it would prove to be much more economical than steam operation, capital investment and high interest rates being considered. In Bavaria the mountain line from Munich to Garmisch-Partenkirchen and some branch lines which are important for foreign travelers, have been electrified; furthermore,

the electrification of a section from Munich to Landshut and from Munich to Regensburg was undertaken. The electrification of the Northern Berlin suburban lines was considerably advanced.

Improvements in Cars and Locomotives

Worthwhile improvements are furthermore to be noted in rolling stock. Here the idea of standardization is predominant. For instance, uniform types of cars for passenger service have been determined on, the frames of which are made of steel. When the German railways were owned by the various states and before they were taken over by the federal government they created through the German State Railway Car Association, to which all the states belong, uniform types of freight cars. The construction of these different types has again been thoroughly revised. With regard to locomotive construction, special types have been developed in order to eliminate the approximately 210 types taken over from the various state railways. The first of these new engines, i. e., two C-1 express train locomotives, have already been placed in operation. In addition, 200 heavy freight cars of ten different types have been built for test purposes, all equipped with devices for automatic unloading. For all these cars a new reinforced screw coupling with a breaking stress of 70 tons has been introduced.

During the year all freight cars not previously so treated have been equipped with the Kunze Knorr brake, and in this way air braking in freight service has been completed. This improvement has made possible great savings in wages over hand braking. A reduction in motive power expense is being sought in high capacity Diesel and turbine locomotives. Further experience, however, will be necessary to determine whether the savings in fuel of these types are not counterbalanced by increases in other expenses. Gasoline rail motor cars have been tried out during the year; and cars operated by steam, batteries and a newly developed high-speed Diesel motor are in service. The cost of operating storage battery cars has been considerably reduced by increasing the capacity of batteries so that one charge is good for 185 car miles. In this way all charging is done at night when current can be obtained at much lower rates than during the day.

Roadway Improvements

Recent development points to further improvement in an increased use of high-capacity freight cars and heavier locomotives, which latter are being introduced. This change has made necessary the reinforcement of bridges and some new construction. For instance, at Hamburg, Stendal and Meissen three large bridges over the Elbe are under construction, as is a Rhine bridge near Duisburg-Hochfeld and large bridges over the Havel near Potsdam and Rathenow. A new steel is being used in these bridges which is effecting great economies. Thus, for instance, in the Rhine bridge near Duisburg-Hochfeld a saving in weight of about 3,000 tons, and accordingly a saving in construction cost of about one million marks, was obtained. The railways at the present time are trying to improve this steel further. Storage battery industrial trucks are being used in shops and the large freight and transfer stations.

Will the Reichsbahn "Make the Grade"?

The Reichsbahn-Gesellschaft has thus up to the present time attained its aims. Will it be able to continue to do so—to carry the increasing reparations charges? The answer will depend only in part on the operations of the Reichsbahn-Gesellschaft itself. The real solution lies in the general economic condition of the country. Upon that depend adequate traffic and earnings for the railways.

Italian Lines Show Great Progress

Are earning money and now turn attention to electrification and other improvements

By Antonio Giordano

SINCE the beginning of 1919 the principal problem of the Italian State Railway Administration has been a financial one. The deficit rose from 859,751,496 lire during the fiscal year 1919-1920 to 1,257,946,309 lire during 1922-1923, while according to the official announcement during the fiscal year 1924-1925 the Administration will show a net profit of 176 million lire.

Traffic and Rates

In the same period receipts from passenger traffic showed an increase of 80 per cent and receipts from freight traffic showed an increase of 20 per cent. On the other hand during the fiscal year 1924-1925 passenger traffic increased 68 per cent over 1923-1924, and freight 7 per cent, notwithstanding the total passenger train-kilometers decreased from 73 million to 69 million. Freight train-kilometers likewise increased less than the volume of traffic.

ROLLING STOCK SITUATION

	January- June 1924	July- December 1924	May 1925	June 1925
Serviceable locomotives (steam and electric).....	5,220	5,372	5,437	5,429
Percentage awaiting repair.....	22.4	21.3	21.6	21.7
Serviceable passenger cars.....	6,625	6,502	6,457	6,566
Percentage awaiting repair.....	36.4	35.4	37.5	36.2
Serviceable freight cars.....	139,670	141,231	135,536	135,807
Percentage awaiting repair.....	11.9	11.5	12.0	11.8

In April, 1925, passenger fares were increased by 25 per cent for ordinary tickets, and by 40 per cent for monthly, quarterly or annual tickets, and the reductions granted to the government officials, journalists, etc., were greatly decreased; freight rates have been increased by 200, 300 and 400 per cent over pre-war according to the class of goods.

Railway Personnel

The average personnel employed by the Italian State Railway Administration during the fiscal year 1924-1925 was 172,000, against 184,000 during the preceding year. In 1924-1925 wages were greatly increased bringing the pay schedule to the following level:

Offices:	Per Annum
Principal Head of Department.....	Minimum *Lire 37,000
Superior Head Inspector.....	Minimum Lire 28,500
Head Inspector and Cashier.....	Minimum Lire 23,300
Principal Inspector and Class I Cashier.....	Minimum Lire 20,200
First Class Inspector and Second Class Cashier.....	Minimum Lire 17,000
Second Class Inspector.....	Minimum Lire 15,300
Apprentice Principal Inspector.....	Minimum Lire 12,000
Other Clerks from Secretary to Typist.....	Minimum from L. 14,400 to 7,800
Messengers.....	Minimum from L. 7,800 to 6,000
Stations:	
Stations Master to Clerks.....	Minimum from L. 17,000 to 7,700
Workmen.....	Minimum from L. 7,600 to 6,100

Trains:

Controller to Conductor.....	Minimum from L. 12,000 to 6,300
Head of Locomotives Terminal to Enginemen.....	Minimum from L. 17,200 to 6,600
Technical Departments:	
Head to Clerk.....	Minimum from L. 17,200 to 6,300

* The lira is worth slightly more than 4 cents at present exchange rates.

Notwithstanding the law establishing the 8-hour day efficiency of operation and particularly of labor has not been affected.

Additions and Betterments

Much improvement work to line and stations has been undertaken during the year.

A credit of 352 million lire has been allowed for new works on stations, track, etc., during the period 1925-1927.

In view of the increasing traffic the railways have during the year ordered 50 new heavy express steam locomotives, 100 passenger cars, 15 baggage and mail cars and 200 freight cars; a special credit has been allowed to order refrigerator cars for export of fruits from Italy to Northern Europe.

Repair work on rolling stock was divided between the railway shops and private companies as follows:

	1924-1925	1923-1924	1922-1923
	millions of Lire		
Repairs made in railway shops.....	306.9	326.8	380.2
Repairs made in private shops.....	203.9	243.9	290.4
Total millions of Lire.....	510.8	570.7	670.6

During the fiscal year 1924-1925 private shops repaired 648 locomotives as against 621 in the fiscal year 1922-1923, and 38,500 cars as against 42,037.

The locomotives which are present in use entirely satisfy the requirements of the railways and new types of steam locomotives have not been considered. However, the question of the application of Diesel engines to locomotives has been considered and it is not impossible that within a short time tests will be made of the operation of such types of locomotives which the Fiat Motor Car Company (Diesel department) is studying. A type of Diesel-electric locomotive is already in use on the Calabro-Lucano line.

The railways have ordered five electric locomotives for the lines in the Varese district of 650 v.d.c., the construction of which has begun. Other locomotives for freight and passenger service on the Foggia-Benevento line, which is to be electrified are under order.

In view of the extension of three-phase electrification a new type of electric locomotive with five coupled axles for mountain lines is planned. The new locomotives

THE ITALIAN STATE RAILWAYS—SELECTED STATISTICS

	July 1st Dec. 31st 1923	July 1st Dec. 31st 1924	February 1925	March 1925	April 1925	May 1925	June 1925
Metric ton-kilometers (millions).....	22,102	24,992	3,952	4,327	4,256	4,514	4,395
Passenger train kilometers.....	32,205,988	35,410,591	5,628,042	6,304,900	6,140,501	6,366,674	6,268,708
Income from passengers and baggage traffic (millions of lire).....	639.6	739.9	91.5	100.2	139.3	140.3	152.3
Freight train kilometers.....	23,182,464	26,694,204	4,352,030	4,730,622	4,558,704	4,745,334	4,769,437
Income from freight traffic (millions of lire).....	1,034.0	1,217.1	209.3	209.1	224.0	252.2	289.9
Car loadings.....	2,876,220	3,358,996	498,005	539,687	524,612	538,046	516,777
Metric tons loaded.....	26,880,017	32,039,195	4,958,434	5,306,067	5,189,654	5,306,457	5,058,632
Number of persons employed.....	194,670	173,831	176,252	176,758	176,907	177,360	177,545

will be equipped with oil-burning boilers for train heating to allow the discontinuance of the present practice of carrying an extra car equipped with a coal-burning boiler for heating.

Third-class passengers cars, of all-metal construction, are being built for international train services.

Electrification

The improvement in finances has given a new impetus to electrification. At the outbreak of the war there were only 500 kilometers (311 mi.) of electrified line in Italy. Owing to the difficulty of obtaining fuel supplies during the war, electrification was undertaken and now includes: the tracks in the port of Genoa, 14 km.; Genoa-Sestri Levante, 43 km.; S. Pier d'Arena-Savona-Ceva, 86 km.; Giovi tunnel line, 59 km.; Ronco-Torino, 137 km.; Ronco-Arquata-Tortona, 34 km.; Novi-Tortona, 17 km.; Bormida-Voghera, 47 km.; Sangone-Torre Pellice, 47 km.; Bricherasio-Barge, 107 km.; Bussoleno-Susa, 13 km.; Trofarello-Chieri, 9 km.; Monza-Lecco-Sondrio, 143 km.; Milan-Portoceresio, 73 km.—a total of 825 kilometers (512 mi.).

Electrification is in progress on the Sestri Levante-Pisa-Livorno line, 138 km.; Bologna-Porretta-Florence, 132 km.; Rome-Avezzano-Sulmona, 172 km.; Foggia-Benevento, 102 km.; Naples-Pozzuoli, 15 km.—totaling 559 kilometers (347 mi.).

While electrification has been completed on the line from Sestri Levante to Pisa and between Pisa and Leghorn, actual electric operation has not been begun. Electric current is to be supplied from generators driven by internal combustion engines which are to use gas obtained from the distillation of lignite. This work has not yet been completed, but it is expected that it will be in 1926. Several power plants are under construction, among which are the hydroelectric plant at Bardonecchia for the Turin-Modane line, and those at Reno and Limentre in the Bologna district to supply the current for the operation of the Bologna-Florence, and of the Faenza-Florence lines on which it is hoped to initiate electric traction in 1925. Furthermore in Southern Italy the railways have undertaken the construction of hydroelectric plants at Saggitario and Sila in the Calabria district.

New Lines Proposed

The chief problem which Italy has to face at present is the improvement of her railway connections with the countries to the north and particularly on the Verona-Brennero-Innsbruck line, on the Venice-Trento line and on the lines between Trieste and Yugoslavia, improvement which can be obtained only through electrification, which alone will make possible an increase in the speed of the trains. Secondly, as it is impossible to undertake at once the construction of new lines to carry the excessive traffic on some lines—between North and Central Italy, and between Central and Southern Italy, such as the Bologna-Venice line, the Naples-Rome line—electrification to increase the capacity of existing lines is the only solution.

Furthermore the government desires to render Italy as independent as possible from supplies of raw materials from foreign countries and it is well known that practically all coal must be imported, whereas Italy is rich in water power. For these various reasons, the railways plan to electrify an additional 2,500 km. (1550 mi.) of line.

Competition Between Railways,

Ships and Air Lines

Competition of air and water lines, practically unheard of a year ago, is assuming proportions which lead one to the belief that it may become very important indeed. In

addition to the Messina ferry-boat service the Italian railways have in the past been entrusted with the steamship service connecting Italy and the various neighboring islands. Now the government has decided to entrust such services to a private company and to abolish the shipping department of the Railway Administration. The private operators are planning to increase the efficiency of these services, and this will give rise to some competition with the railways.

Another private ship operator plans to establish an express de luxe service with two sailings every week between Genoa and Barcelona with speedy and up-to-date liners enabling travelers to make the trip in 24 hours, as against 48 hours by rail.

There is at present little airplane service but in 1926 it is proposed to establish it on the following routes: Genoa-Rome - Naples - Palermo; Turin - Milan - Trieste; Brindisi-Piraeus-Smyrna; Genoa-Barcelona and Trieste-Vienna. The airplanes on these lines will carry 15 passengers each and mail matter. The tariffs have not been published as yet and it would appear that charges will be as low as first-class fares on the railways.

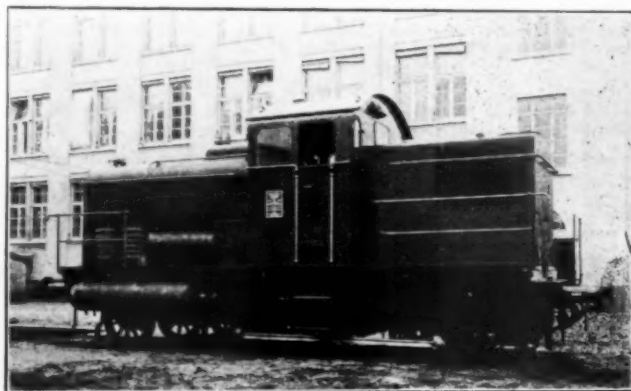
Other Important Projects

Italian business interests are urging the construction of important new lines, called respectively the Stelvio and Predil lines. The Stelvio line would start from Milan and run to Munich through Sondrio, Bormio, the Stelvio pass, Landeck and Tern. It would reduce by 120 km. the distance between Milan and Munich, and would permit Italy to control 273 km. of the line connecting the country with Germany instead of only 49 km. as at present.

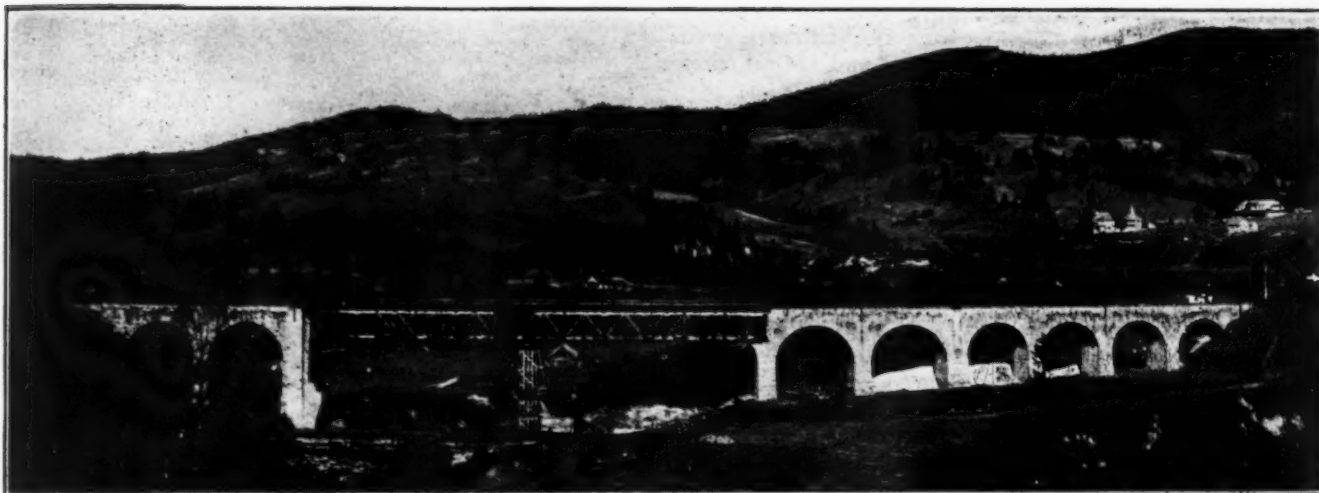
The length of the new line to be built on Italian territory would be 121 km. with a tunnel of 18 km. through the Stelvio pass, while the Austrian Government would be compelled to build the line between Resia and Landeck, 51 km., on the basis of the treaty of St. Germain. The project is estimated to cost about 500 millions lire.

The Predil line would connect the port of Trieste with Austria and Czechoslovakia without crossing Yugoslavia, and should start from Trieste and reach Tarvisio through Monfalcone Cormons, Cividale, Creta and Plezzo with a tunnel of 9 km. through the Predil pass. The line would reduce the distance between Trieste and Tarvisio and consequently between Italy and Austria, and between Italy and Czechoslovakia by about 80 km. with the result that one customs barrier would be eliminated in traffic between Trieste and its hinterland.

Other projects call for the construction of new lines between Cuneo and Marseilles, a direct line between Bologna and Florence, a direct line between Trieste and Pola, and Trieste and Fiume, etc.



A 250 hp. Diesel with Lentz Drive



Temporary Reconstruction of Stone Arch Bridge Damaged in War, Polish State Railways

Polish Railways Improve Steadily

War damage repaired—Considerable new construction and new equipment—Operating ratio, 90

By Professor A. Wasiutynski

ON July 1, 1925, the railway system of Poland consisted of 10,461 miles of standard gage railways, of which 3,273 miles were double track and 11 miles had three tracks, and 1,868 miles of narrow gage lines. All standard gage lines (with the exception of 78 miles) and 1,110 miles of narrow gage lines are operated by the government. As compared to 1922*, the mileage shows an increase of 547 miles of standard gage lines, as follows:

Mileage operated in 1922.....	9,914 miles
Railways in upper Silesia transmitted to Poland..	331 "
Lines newly constructed	216 "
Total.....	10,461 miles

Poland, in respect to mileage, occupies the fifth place in Europe—after Russia, Germany, France and Great Britain. With an area of 150,000 square miles and a population of 27.1 millions (according to the census of 1921), the density of the railway systems of Poland is 7.0 miles per 100 sq. mi. and 3.9 mi. per 10,000 inhabitants, i. e., about $\frac{1}{3}$ less per 100 sq. mi. and $\frac{5}{6}$ less per 10,000 inhabitants than in the United States. Railways are very unequally distributed in different districts of the country, as they belonged to three different systems before the war, viz., Russia, Austria and Prussia. The interest of the three governments in railway development in Polish territory differed greatly. As may be seen from the following figures, the density of railways in the former

District	Area in 1000 of sq. mi.	Population according to the census of 1921 in millions	Railway mileage Sept. 1925	Miles per 100 sq. miles of area	Miles per 10,000 inhabitants
Former Russian Poland	101.2	15.5	4591	4.5	2.9
Former Austrian "	31.0	7.7	2807	9.0	3.6
Former Prussian "	17.8	3.9	3063	17.2	7.8
	150.0	27.1	10461	7.0	3.9

Prussian district is about the same as in western Europe, whereas in the former Austrian section of Poland it is only

* See article by Col. A. B. Barber, *Railway Age*, January 6, 1923.

half and in the former Russian only one-third as great.

This unequal situation is highly resented in the former Russian district. The chief and most difficult task of the Polish ministry is to complete and unify this heterogeneous system, and to adapt it as a whole to the necessities of the country.

Rolling Stock

The rolling stock which Russia, Austria and Germany left to Poland was insufficient as to quantity and mostly



Company Dwelling for Two Families—Division Engineer and Station Master

in very bad order. In 1919 Poland had no locomotive factory within its boundaries and the car factories and repair shops were destroyed during the war. These circumstances obliged the Polish government at first to procure from abroad the necessary rolling stock and to make contracts with foreign concerns for the repair of a part of its locomotives. At present Poland has three loco-

tive factories and six car factories, in which all necessary rolling stock for Polish railways, i. e., locomotives as well as passenger and freight cars, standard and special, may be constructed. Old repair shops are for the most part reconstructed and the construction of new ones is so far advanced that rolling stock may be repaired and built at home. Polish rolling stock factories are provided with all modern technical arrangements and their products are equal in quality to the best foreign ones. All necessary materials used in the construction of rolling stock, with the exception of copper, are produced in Poland, and are of the best quality. Standard specifications are established and a special staff controls the furnishing of materials and the construction of rolling stock.

The Polish State Railways have three of their own types of locomotives, of which one is passenger and two freight. In their design special attention was paid to the quality of Polish coal, which is very good for locomotives, but of rather moderate caloric value (6,500 calories per kg.= 11,700 B.t.u. per pound). The locomotives were designed as heavy as possible in order to increase the train load, but the maximum axle loads of 17 to 18 tons admitted by the permanent way and bridges was a limiting factor. The new Polish passenger locomotive is of 10-wheel type, 83.5 tons in weight; the freight locomotives of Consolidation and Decapod types, 80 and 95 tons weight, all three simple with superheaters.

New passenger cars are exclusively on bogie trucks, with electric lighting and low pressure automatic heating. First and second class cars are provided with sleeping accommodations. All passenger cars are equipped with automatic high pressure brakes and are piped for vacuum brakes. Cars for international service are equipped both with high pressure and vacuum brakes.

The new freight cars for the Polish State Railways are of two-axle type, gondolas of 20 tons' and box cars of 15 tons' capacity. Before designing these cars a standard car of higher capacity, such as was purchased in 1920 and later from the United States, was considered. Experience showed, however, that cars of lesser capacity answered better for local conditions. The introduction of air brakes on all freight trains is intended, but the additional cost of this equipment is a drawback to their introduction on Polish as well as other European railways. Special trains are formed with American freight cars, which were all furnished with air brakes.

From 1919 to 1925, 780 locomotives, 470 passenger cars and 28,300 freight cars were procured. In the same period Poland received from Russia, Austria and Germany, according to treaties, a certain amount of rolling stock, and locomotives and cars unfit for further use were put out of service. The state of rolling stock on Polish railways may be judged from following figures:

	1921	1922	1923	1924
Mileage operated miles	9,541	9,914	10,304	10,368
Number of Locomotives	3,763	4,374	5,030	5,079
" " " per 10 miles	3.9	4.4	4.9	4.9
" " " in repair	1,594	1,669	1,675	7,493
" " " per cent	42.4	38.2	33.3	29.4
Passenger cars	8,680	9,454	11,710	11,661
" " " per 10 miles	9.1	9.5	11.4	11.3
" " " in repair	2,382	2,793	2,520	2,691
" " " per cent	27.4	29.5	21.5	23.1
Freight cars	84,044	97,145	118,471	126,469
" " " per 10 miles	88.1	98	115	122
" " " in repair	15,278	13,268	15,036	16,180
" " " per cent	18.2	13.7	12.7	12.7

At the present time, the locomotive and rolling stock equipment of Polish railways is quite sufficient for the needs of traffic. In 1924, when for a certain period traffic was reduced, there was a surplus.

Operating Statistics

The following figures illustrate the progress of operation on Polish railways:

	1921	1922	1923	1924
Mileage operated	9,541	9,914	10,304	10,368
Passengers carried, thousands...	121,605	140,080	141,515	176,981
Freight loaded, thousands of tons	25,176	36,202	43,282	53,448
Passenger train miles, thousands	20,837	27,303	32,085	30,930
Passenger per mile of line operated	2,184	2,756	3,115	2,985
Freight train miles, thousands...	15,458	20,208	23,439	21,308
Freight train per mile operated..	1,620	2,040	2,275	2,057
Average number of trains operated daily per mile of line..	10.4	13.1	14.8	13.8
Average number of car axles per passenger train	26.1	27.6	27.5	26.5
Average number of car axles per freight train	78.9	75.3	80.9	82.4
Average number of passengers per passenger train	217	204	185	137
Average freight carried per axle of freight trains, tons	2.63	3.57	3.45	3.88
Average loading of freight trains, tons	207	269	279	320

As may be seen from the above figures, in 1921 to 1924 the number of passengers carried and freight loaded increased very materially, though the number of train-miles in 1924 slightly declined.

Freight cars are each year better utilized. The average number of axles in freight trains in 1924 as compared to 1921 shows an increase of 4.4 per cent, the average axle load an increase of 47.5 per cent, and the average load per train an increase of 54.6 per cent. The result was that in 1924 a larger traffic was handled by a lesser number of trains.

Maintenance of Way

The total number of ties in track of normal gage is about 40½ millions; of these about 30½ millions are in main track. In 1924, 3½ million ties were renewed. The weight of new laid rails is mostly 82.7 lb. per yard. The requirements of steel for the next five years are in accordance with a program of 280 miles of track yearly.

In 1924 the receipts of the normal gage railways amounted to \$151,750,000 and the operating expenses to \$137,600,000 giving \$14,150,000 of net receipts and an operating ratio of 90.7 per cent.

Construction of New Lines

Of the official program of new construction 216 miles of new lines were built and 380 miles are in construction. Concessions for the construction of 900 miles of railway have been granted.

New Lines Opened for Traffic

Kokoszki-Strzalkow	69 miles
Kokoszki-Gdynia and Puck-Hel	45 "
Nasielsk-Sierpc	55 "
Kutno-Plock	29 "
Connecting lines in Upper Silesia	18 "
Total	216 miles

Lines Under Construction

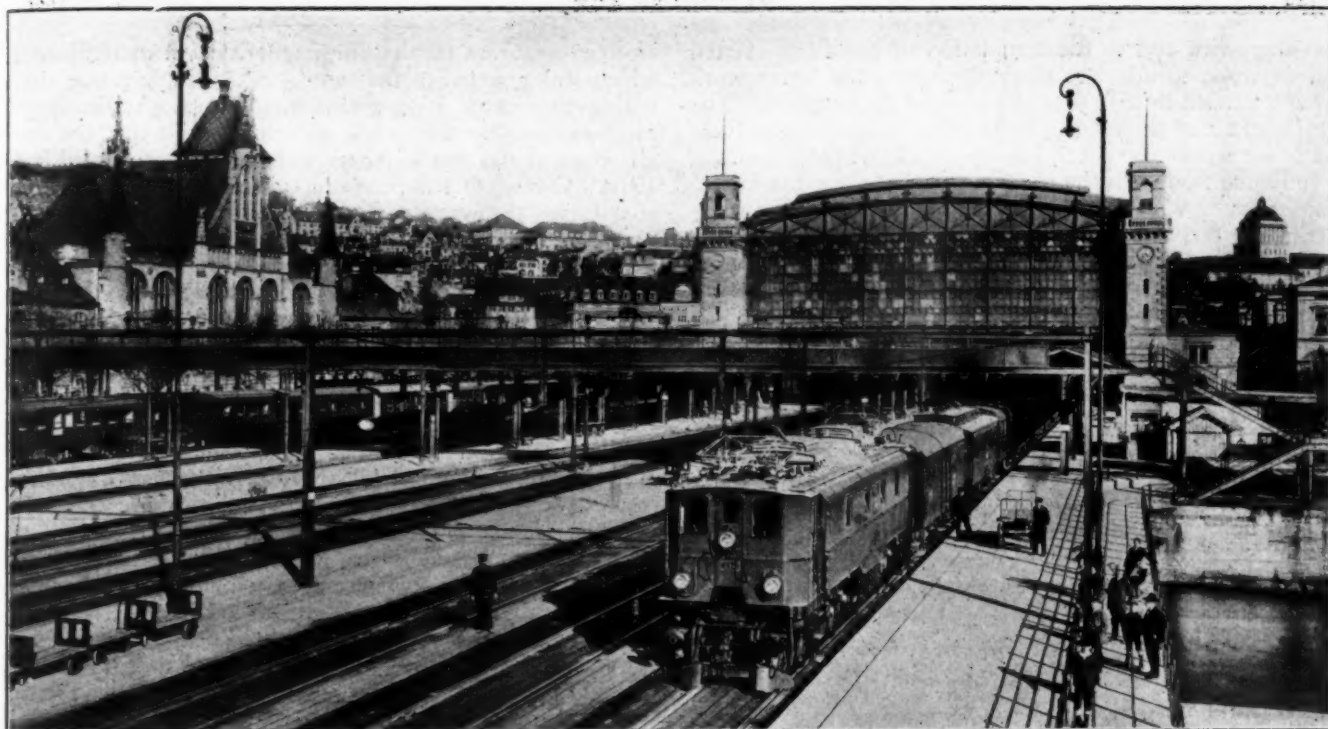
Widzew (Lodz)-Kutno	46 miles
Kalety-Podzamcze	71 "
Bydgoszcz-Cdynia	118 "
Luck-Stoianow	52 "
Rzeszow-Tarnobrzeg	45 "
Other lines	48 "
Total	380 miles

The reconstruction of the Warsaw terminals is going forward rather slowly due to economic conditions. Still it must be noted that the huge piers on caissons of the Vistula bridge, the viaduct across the lower city and about half of the tunneling for the trunk line with canalization syphons are finished.

War Damage Repaired

The amount of destruction of railway property during the war and of work done to make it good may be judged from the following data:

	Destroyed		Rebuilt	
	Number	Yards	Number	Total length
Bridges up to 20 yards of span.	2,082	9,810	861	45 3,740 43
Bridges of larger span.....	379	25,400	172	41 10,670 38
Station buildings	520		435	82
Magazines	535		338	62
Water works	471		373	79
Locomotive sheds	101		63	63
Administration building	3,282		1,562	48



Zürich Station

Electrification Progress in Switzerland

Earnings have been good in last three years—Electrification and hydro-electric development move forward

By I. Goettler

THE improvement in economic conditions which began in 1923 has exercised a favorable influence on the yields of the Swiss railroads, and especially on those belonging to the government. The income of the Federal Railroads was 22,800,000 Swiss francs higher in 1923 than in 1922 and 15½ million better than predicted in the budget for 1923. To this improvement is added a decrease in operating expenses which was in 1923 in comparison with the year 1922, about 53½ million francs and which was 13,700,000 francs lower than the budget estimate. The operating surplus for the year of the Swiss Federal Railroads was 107,447,349 francs; that of all standard gage railroads, narrow gage railroads and cog railroads 123,926,771 francs.

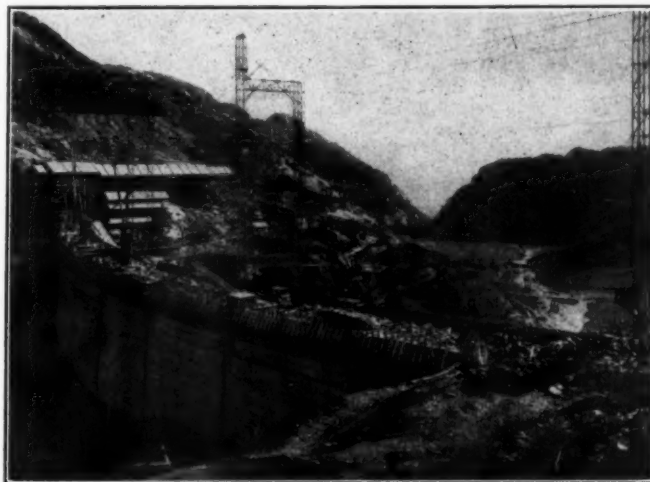
The yields of the year 1924 showed a further improvement. The operating income of the Federal Railroads was 36,810,000 francs higher than that of the year 1923 and about 29.25 million francs better than the budget estimate. The increase in the operating expense was 11.78 million francs higher than that of the previous year; on the other hand, the expenditure was 7.19 million francs lower than provided in the budget. The year 1925 will bring a slight set-back on account of falling off in freight traffic.

Business Exceeds Pre-War

In the year 1923, 95,441,000 passengers were handled on the Federal Railroads, which not merely equaled, but far exceeded, 1913. The same is true of freight business.

Freight handled in 1923 totaled 14,659,000 metric tons and in 1924 16,613,000 metric tons, an increase of 2,000,000 over 1913.

Conditions in the building line are greatly improved in



Building a Hydro-electric Dam

regard to prices. However, there is still some hesitancy in erecting new buildings. Building activity has therefore been limited mainly to electrification and work in connec-

tion therewith and to the completion of buildings started and to work to alleviate unemployment; the latter work being awarded to bids submitted to the government. The total amount of the credit granted the Swiss Federal Railroads for works to relieve idleness is 27,845,000 francs.

In connection with the electrification and for the extension of traffic with the heavy steam engines, the reinforcement and reconstruction of bridges has been furthered. Among others should be mentioned the reconstruction of the steel bridge across the Orbe near Vallorbe into a stone viaduct.

The labor situation has improved. We had no strikes.

Electrification

The Swiss railroads, chiefly the government railroads, are being electrified. In order to give a clear conception thereof, we have to go back several years.

In 1903, there was organized a commission for the study of electric operation, the purpose of which was to clarify

THE RAILWAYS OF SWITZERLAND

(a) Standard gage:	
Swiss Federal Railroads.....	2,881.2 km.
Private Railroads	736.8 "
(b) Narrow Gage Railroads.....	1,479.8 "
(c) Cog Railroads	169.0 "
(d) Tramways	484.5 "
(e) Aerial Tramways	49.1 "
Total length	5,800.4 "
	(i. e. 3602 mi.)
Of these the following were electrified at the end of 1923:	
Standard Gage: Government Railroads	497.7 km.
Private Railroads	300.9 "
Narrow Gage	1,207.8 "
Cog Railroads	109.4 "

the technical and financial basis for the introduction of operation by electricity of the Swiss Federal Railroads.

electric operation on the line from Erstfeld to Bellinzona, which was granted in the same year. Single phase alternating current of 16 $\frac{2}{3}$ cycles was chosen. At the beginning of the war this work was delayed so that the construction of the Ritom power station was not started until 1916. Owing to the pressure caused by the shortage of coal during the war interest in electrification increased. At public meetings and in the press, prominent citizens demanded a report on a detailed program, dealing with the introduction of electric operation on the Federal Railroads. This request was granted; the general management submitted a detailed program to the board of directors in its report of July, 1918.

Therein it was stated that the electrification of the Federal Railroads would require a minimum of 750 million francs. It was figured that the electrification would require 30 years to be put through and that 25 million francs per annum would be needed for this purpose.

This amount did not include the purchase cost of the electric locomotives. These were not included since it was believed that they could be purchased slowly simply to replace defective and worn out steam locomotives.

For electrification purposes the lines of the Federal Railroads were divided into three groups and it was estimated that each of these groups would be electrified within the term of 10 years and that the first group would be electrified between 1919 and 1928.

To procure the water power necessary was the next problem. It was known that for the electrification of all the Federal Railroads 200,000 horse power at the turbine shaft would be required. For producing such power, the railroads have made the following installations which yield, on the average, 150,000 hp. at the turbine shaft and are sufficient for the electrification of three-fourths



At a Station on the Lotschberg Line

This commission, which started work in the year 1904, was composed of the best known Swiss experts on electric operation and railroad building. In 1911 the commission finished its work and submitted in the next year to the general management of the Federal Railroads an extensive report in which the results of the studies were described in detail. At that time the general view was that the Gotthard line on account of its heavy profile and dense traffic and also on account of the discomfort through smoke in its many tunnels should be the first to be electrified and that electrification should be carried to the other lines on the basis of experience and financial conditions.

On the basis of the report of the commission, the government submitted to the management of the Federal Railroads a bill calling for credit for the introduction of

of the government lines:

Reuss river, from Andermatt to Amsteg (with power stations in Goeschenen, Wassen and Amsteg).
Tessin river, from Airolo to Lavorgo (with power stations in Ritom and Lavorgo).
Rhône river, from Fiesch to Moerel, and Binna (with power stations in Moerel and Fiesch).
Barberine, Eau Noir and Trient rivers (with power stations at Châtelard and Vernayaz). In addition thereto the Massaboden power station, which exploits the fall of the Rhône, between Moerel and the discharge of the Massa and supplies the electric power for the Simplon tunnel.

Other power stations are planned for Etzelwerk near Einsiedeln and Aarewerk near Rapperswil.

The Ritom power station, for which credit was granted in 1913, was erected during the years 1916 to 1920. It was handed over for operation in September, 1920. At the same time electric operation of the Gotthard line from Ambri to Goeschenen was opened.

The Ritom power plant uses water from the Ritom lake with a fall of about 800 meters (about 2,700 ft.). The central station is near Piotta on the left bank of the Tessin on the Gotthard line and is, at the present time, equipped with four groups of machinery, each of which has a capacity of about 12,000 hp.

Credit for the construction of the Ritom power station was granted simultaneously with that for the Amsteg power house. This was built between the years 1916 and 1922. It began operation in 1922. The Amsteg work utilizes the fall of the Reuss from Paffensprung (near Wassen) to Amsteg and the Kerstelen river and is situated on the right bank of the Reuss, near Amsteg on the Gotthard line. The total capacity of the six groups of generators is about 80,000 hp., one group furnishing at present industrial power.

Both power plants work jointly and can supply during the year 190 million kilowatt hours of electrical energy. In summer, when the Reuss has abundant water, the Amsteg plant furnishes nearly all the energy, while the Ritom, during this period, is only in exceptional cases used; in winter time, when the volume of water in the Reuss decreases, the Ritom plant supplies nearly all the power.

The Barberine power station (in the southwestern part of the country) was begun in 1919 and finished in 1924. This station utilizes the falls of the Barberine to the village of Châtelard (a drop of about 750 meters). The Barberine and the Nant de Drance rivers are stored in an artificial reservoir, 2,400 meters long, 800 meters wide and 50 meters deep. The machine house is near the Châtelard village on the Martigny-Châtelard line, and has now three groups of generators of 13,000 hp. each. The stow wall is worth mentioning. It is 1,889 meters above sea level. The crown has a length of 285 meters and a width of 3.2 meters. The height of the gravitation wall is 78 meters, the thickness of the fundament 58.6 meters. For its construction 206,000 cubic meters of reinforced concrete were required, with about 50,000 metric tons of cement.

Another power work for the Swiss Federal Railroads will be erected at Vernayaz in the Rhone valley. It will utilize the falls of the Eau Noir and the Trient and also the water coming from the turbines of the Barberine works, between Châtelard and Vernayaz. It is still under construction. These two power plants will produce yearly 230 million kilowatt hours.

The power plants of the Gotthard and Wallis lines will be able to supply the necessary power to the lines of the Swiss Federal Railroads electrified at the end of 1928, with a comparatively small addition of foreign power, even if traffic should then be 70 per cent greater than in the year 1913. At a 100 per cent exploitation of the plants the kilowatt hour cost will be 2.8 rappen (about $\frac{1}{2}$ a cent). In the generators of the power works single phase alternating current of 15,000 volts, $16\frac{2}{3}$ cycles is produced. Part of the power goes directly to the traction line. The works are connected with each other through transmission lines of 60,000 or 132,000 volts. The latter are also conducted to the feeding point, lower works, where the high tension is transformed to 15,000 volts and is delivered to the electric locomotives.

The Gotthard substations in Melide, Giubiasco, Gornico, Goeschenen and Steinen are, in regard to architecture, as much as possible in harmony with the surroundings, while the other substations are open air plants. Such are already in operation at Emmenbrücke near Lucerne, Sihlbrugg, Olten, Brugg, Seebach and in the west of Switzerland, at Vernayaz, Puidoux and Bussigny; others are in construction.

The introduction of the electric operation has been smooth, without important disturbances. The easy,

smokeless and nearly noiseless moving, even of the heaviest trains on heavy grades has made a deep impression in the widest circles and the view that the electric operation of railroads constitutes an important progress has become general. When in the spring of 1923 unemployment in the country threatened to increase and made necessary work to obviate it, it was decided to hasten the electrification of the roads.

The more important private roads also started electrification some time since. For instance, the Bernese Alpine Railway Company (standard gage) has electrified the Loetschberg tunnel line, 194 km. and the Rhaetian Railway (meter gage), 277 km.

While the Swiss Federal Railroads receive the electric power from their own water power plants in Ritom, Amsteg, Barberine, Vernayaz, etc., the Rhaetian Railway gets its power from the Buendener power works and the Bernese Alpine Company from the power works at Spiez, Kandergrund and Muehleberg. The latter also supply power to the government railroad line from Berne to Thun. The Swiss Federal Railroads have today 200 electric locomotives of three different types in operation, to wit: a freight train locomotive, and express train locomotives for mountain service and an express train locomotive for service in the valleys.

The Federal Railroads will in 1928 with 400 electric locomotives do work for which 490 steam locomotives would be required.

On the secondary lines of the Bernese Alpine Railway which were operated by steam, 14 electric locomotives have replaced 24 steam locomotives; on the Rhaetian Railways 25 electric locomotives have replaced 47 steam locomotives.



On the Gotthard Line

The cost for electrifying the total government lines is estimated today at 700 million francs, while formerly the cost was figured somewhat higher.

For the comparison in economy of the electric operation with the steam operation, the so-called "par coal price" has been taken in Switzerland. It comprises such factors in the two operations which can be judged from figures only. The electric operation becomes cheaper, if coal has to be paid for higher than the "par coal price." The government railroads have lately examined the economy of the electric operation and have found that, at a price for coal of 49 francs per ton f.o.b. Basel, the electric operation would not cost more than steam operation. Coal in 1923-24 cost 58 francs per ton.



A Fruit Train on the S. A. R.

An American Looks at the South African Railways

*General manager an admirer of American methods—
Great recovery since war—Electrification progress*

By James Marshall Plaskitt

CECIL RHODES' great dream of empire is now a reality in the Union of South Africa. The Union is no longer a mythical state but a reality; a country of great solidarity possessing the three vital factors for the existence and continuance of real empire. Namely: agriculture, manufacture and transportation.

That great transportation machine known as the South African Railways is probably the most important one of the three factors. Because of the lack of navigable rivers canals and great trunk roads is this true. And South Africa is a land of magnificent distances where industries and inhabitants are mostly segregated in few places and those places far distant from one another.

Early History

In 1860 the first railway in South Africa commenced operation. It was standard gage and about two miles long—from Point to Durban in Natal. About the same time construction started in Cape Colony from Capetown to Eerste river and then extended to Wellington.

Progress slowed down for a while but in 1870 it was boomed and stimulated after the discovery of diamond fields in Grigualand West. Then the great Kimberley mines necessitated the extension of the Cape lines northward. The line from Capetown was completed in 1885

and Bloemfontein five years later. Railway progress in the Transvaal was hampered by opposition of the burghers who thought the then new fangled scheme would destroy their transport riding from which a great many obtained



Camps Bay, S. A. R.

their livelihoods. This difficulty was circumvented by diplomatically calling the first railway in that colony a tram line—the "Rand Tram." In 1890 this line was opened from Braamfontein to Boksburg.

Additional progress occurred when communication between the Cape ports and Witwatersrand was established in 1892, later that year Johannesburg, Delagoa Bay (Portuguese East Africa) and Witwatersrand and Durban in 1894 and 1895 respectively. In 1897 a partial fulfillment of Cecil Rhodes' "Cairo to the Cape" vision occurred when the line north of Kimberley reached Bulawayo in Southern Rhodesia. The Transvaal lines became completely government controlled in 1902.

Dissension 25 Years Ago

Gold and diamonds. They gave the real impetus to railroading in South Africa but progress was made not without a peculiar set of conditions and grave difficulties. There were individual governments; keen competition. The economic structures of Portuguese East Africa, Natal and Cape Colony were revolutionized. They all realized their danger but the 1895 conference in Capetown came to no working agreement. Competitive difficulties were accentuated. Along came the Boer War in October, 1899, and British influence controlled the Transvaal and Orange Free State railways. Even this resulted in a perpetuation of the disputes, disagreements, difficulties.

Railway conditions in South Africa above all others made union of the colonies a vital necessity for peace and progress. Unification of those railways was the sole solution; it was the last resort. And today South Africa possesses one of the few successful government operated systems.

It was a great step in the world's history of railroading when unification of three systems was incorporated into one. Three sets of methods were amalgamated and a new organization created in a remarkably short time considering the prodigious size of the undertaking. In 1910 when Union occurred the mileage taken over was 7,041 and the capital expenditure on railways was £87,263,366. Today the capital is something in excess of £126,000,000.

In 1916, after six years of government control, mileage had increased from 7,041 to 9,457 or 34 per cent. The World War brought any further progress to a standstill and from 1916 to 1923 only 199 miles were opened. During the war the Administration stood the test and emerged from the trials and tribulations of that period strengthened in all directions.

But when times are bad revenue falls off, expenditure has to be suited to new conditions. After the feast came the famine of the vast and unexampled depression following the war. Grave issues affecting the personnel especially had to be solved. They have regained their feet, they have emerged successfully. Their recovery is comparable to that of our own roads in America.

To-day

When you step ashore on the Capetown docks after being spellbound by the unrivalled beauty of majestic Table Mountain you pass the latest type of grain elevator—its gallery feeding the ships alongside the dock. It is one of a chain of the newly completed elevators in the larger South African ports, and points inland such as Klerksdorp and Patchefstroom. You cross the transportation yard and proceed to town up Addersley street and there you find the imposing passenger terminal station of the South African Railways.

Possibly you may go to Johannesburg. You board the Capetown-Johannesburg Mail with its first-class equipment, its luxurious sleeping and dining equipment. At the end of the trip you can readily realize that for a 3 ft.

6 in. gage railway you have experienced a remarkable operation. That particular train makes 956 miles in 29 hours. It actually climbs a total of 18,636 feet—to an altitude of 5,735 feet. It is then that you know you are witnessing the operation of a modernly equipped and administrated railroad.

The real size of the South African Railways may be realized from the following facts:

The area covered by the railways.....	795,539 sq. mi.
The population served.....	7,000,000
The mileage operated.....	11,747
The personnel employed.....	86,181

Through rail communication open from Capetown to:

Walvis Bay	1,635 miles
Beira	2,034 miles
Bukama (Congo)	2,600 miles

During the year ending March 31, 1924

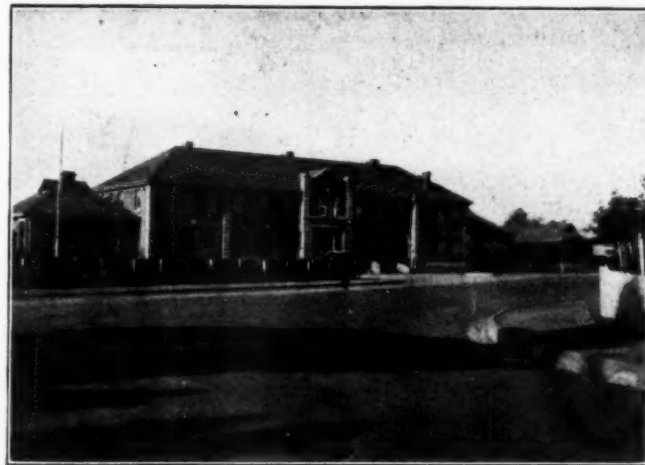
The administration earned.....	£21,594,644
The administration spent in operating the railways.....	£15,980,733
The administration conveyed goods, minerals and coal....	22,664,421 tons
The passengers carried.....	65,811,610
Livestock carried totaled.....	3,020,851 head
Train miles run were.....	38,144,422
Cargo handled in harbors.....	6,898,745 tons

To appreciate what progress the foregoing figures represent consider the development that has occurred since Union was accomplished May, 1910:

The passenger traffic has increased by.....	104 per cent
Freight traffic has increased by.....	105 per cent
Coal traffic has increased by.....	127 per cent
Livestock traffic has increased by.....	57 per cent
Earnings have increased by.....	107 per cent
Expenditure has increased by.....	182 per cent
Open mileage has increased by.....	61 per cent
Train miles have increased by.....	94 per cent

The Reason for Narrow Gage

The change from standard gage to the 3 ft. 6 in. gage was necessary because of the extension of the lines through the mountainous country of the interior. The



South African Railway Station at Ladysmith

narrow gage allows use of sharper curves and cost reductions. Speeds and train loads have been secured which at first were deemed impossible. There are also 1,102 miles of 2 ft. gage lines in the districts where traffic is light.

The South African Railways have also seen great advances in motive power. The first locomotives were of the 14-ton type with tractive power of 7,000 lb. In October, 1908, the articulated type of Mallet was introduced. Now there are locomotives in service with a tractive force as high as 53,750 lb. The engine runs average 160 miles for the system, which is a very favorable comparison with the best operations in America.

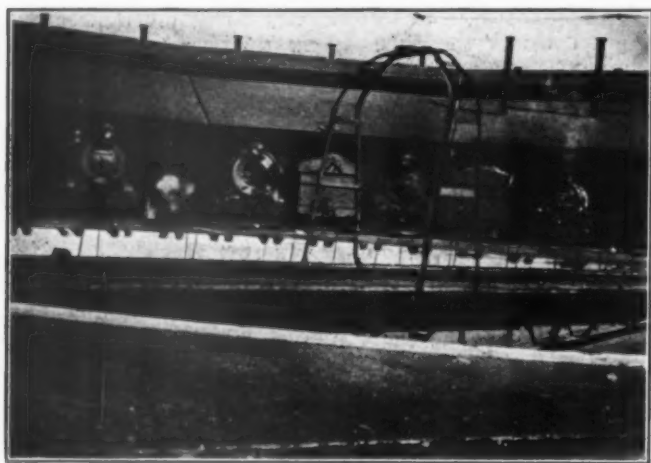
Rolling Stock

The modern standard first-class main line passenger saloon coaches provide seating accommodations for 39

passengers and sleeping accommodations for 26. The standard suburban coach is of the central passage type and is most familiar to travelers on the Cape suburban line. A first-class coach provides accommodation for 72 passengers. Passenger cars as a whole in South Africa are of the highest standard and the S. A. R. is probably the only system in the world that furnishes good sleeping accommodations without extra fare or additional charges.

In all but short distance passenger trains dining cars are included. Their latest development is a twin dining and kitchen and staff car that has lately been put into service. The dining car is used for serving meals only and provision is made for 46 people at one sitting. The adjoining car contains kitchen and accommodations for the staff.

The earliest freight cars in South Africa were four-wheeled or six-wheeled wooden sided gondolas with a carrying capacity of 10 or 15 tons. Cars now in use average around 50 tons' capacity. Tank cars for oil, insulated cars for perishables, hopper cars for coal and



Roundhouse at Bloemfontein, Orange Free State

well type cars for machinery and other heavy loads are in service; traveling cranes for wrecks and breakdowns. All the stock is valued at £11,912,709, which is a tremendous advance over that at the time of Union when the value was only £5,706,154.

Mechanical

There are seven large shops on the system. They are electrically equipped and facilities are provided for the construction and heavy repair work for locomotives and rolling stock, marine equipment, etc. Quite an imposing amount of manufacturing work is done in the shops. About 50 per cent of the new passenger equipment and about 25 per cent of the freight have been built in these shops. Most of their own casting work is done at these plants and there is a railway steel foundry in Pretoria. The personnel of the shops consists of about 6,500 Europeans and 3,000 others.

Electrification Progress

Probably electrical power will be widely used for commercial, industrial and agricultural purposes in South Africa. As far as the railways are concerned progress will be stimulated by the use of it because the heaviest traffic is handled over some of the heaviest grades and severest curves. Great progress is being made on the first section to be electrified which is from Glencoe Junction to Pietermaritzburg and the Howick branch line—173 miles. The electrification of the Capetown-Simonstown line is also another advancement soon to be completed in the modern railroading scheme of the Union. This elec-

trical service for the Capetown suburban area (one of the most captivating and alluring suburban districts in the world) will include 54.7 miles from Capetown to Simonstown, 7.9 miles from Monument to Sea Point and 2.7 miles from Monument to Capetown Docks (passenger service only). The multiple unit system is the method of operation to be used. To provide for the expansion of increasing suburban travel in the future and the elasticity of augmenting or reducing train service as rush periods may require, the 1,500 volts d. c. from overhead contact wires will allow the administration to achieve results that were hitherto impossible with steam service.

The power for the largest project of 175 miles up in the Durban district of Natal is generated at the big power station at Colenso.

Nearby the power plant is the step-up sub-station. There are 12 other sub-stations on the line of road. One of the 78 electric locomotive units for use on this line was specially completed in England for exhibition in the South African section of the British Empire Exhibition at Wembley.

Efficiency Problems

The questions of longer runs for locomotives, fuel performance, and reductions in operating expenses are being handled much the same as on our own larger American systems. For many years it has been the administration's policy to limit the pooling of the larger passenger engines as far as possible. But the run for Mafeking to Bulawayo and return (980 miles); the run from Pietersburg to Komatipoort and return (600 miles) has been run by the



Dispatcher's Office, Natal District, South African Railways

same engine under the caboose system, i. e., the first set of trainmen work while the second set rests, and vice versa. There are other long runs over two or three divisions. Extensive campaigns with the crews have resulted in very effective fuel savings.

The Management's Estimate of American Operation

It was after a luncheon in the Capetown Houses of Parliament given by the Prime Minister General Jan Christian Smuts that the writer first met Sir William Hoy, K.C.B., general manager of the South African Railways. At the latter's invitation we repaired to his office in the huge building over the Capetown passenger station. The sentiment of the people of South Africa and the evidences on all sides as to their progressiveness was well expressed when Sir William during the course of our conversation said:

"You know we consider that the operations and practices of the American railways are standard of the world and we try to pattern our own operations accordingly."



Plaza Constitución Station, Buenos Aires

South American Railways During 1925

Conditions satisfactory in Argentina—Not so happy in some other countries

By W. Rodney Long

THE following article briefly summarizes by country railway developments in various South American countries during the past year:

During 1925 the railways of Argentina showed normal development of their activities; having satisfactorily met the general needs of traffic and at the same time noticeably extended their lines, considering their economic and financial condition.

Argentine Railways Finish Satisfactory Year

The length of the railways has been appreciably increased by the opening to public service of various sections of the state railway lines under construction. These sections which have been opened are as follows:

On the Rosario extension from Lerma to Socompa up to kilometer 71; on the Embaracacion extension to Yacuiba up to kilometer 88; on the Metan extension to Barranqueras up to kilometer 65; on the Antilla extension up to Rosario de la Frontera; on the Catamarca extension to Tucuman up to kilometer 41; on the San Juan extension to Jachal up to kilometer 24; on the Patagones extension to San Antonio up to kilometer 188; on the 448 kilometer extension to Lake Nahuel Huapi up to kilometer 115; and on the Puerto Madryn extension to Colonia, up to kilometer 151. These new lines being incorporated in the service, the length of the railway lines under national jurisdiction is actually 35,805 kilometers (22,234 miles).

The opening of the Atocha-Villazon Railway in Bolivia, provided additional traffic possibilities for the Argentine railways. During the last part of the year two projects of major importance were discussed. Both of these have every prospect for being officially approved during the

coming legislative session. One is for the extension of the subway system in connection with bus service from the termini and the other is the request of the Argentine State Railways for a loan of 509,000,000 paper pesos in series of 60,000,000 pesos annually for the reorganization and new construction of its railway system.

The general results of railway traffic have been satisfactory; the proof of this will be found in the fact that the number of passengers carried has exceeded that for the past year by 14,000,000; the total amount of freight carried has increased over that of the past year by 8,000,000 tons.

Special attention has been paid to keeping rates within the range established by law and likewise that the revenues thereby obtained should not exceed the maximum of profit defined by law.

A summary of the finances of the government railways resulted in the total capitalization being fixed at \$1,106,949,422 as of June 30, 1922.

During the year, the larger part of the railways of the republic continued the installation of signaling equipment. The larger companies are engaged in increasing their lines to care for additional traffic. This has been true in particular on the sections in the cities and as a result it was found necessary to increase the signaling of these sections. The Eastern Railway is studying a new method of signals over its entire local section up to Moreno. The Pacific Railway, in view of its double track between Palmira and Alto Verde, has changed its system of signals in all the states included in the section; the Southern Railway has likewise changed its system of signals due to the quadrupling of its lines between Remedios de

Escalada and Temperley. The three position, automatic and semi-automatic signals which some companies propose to install, together with modifications of the general railroad regulations which are necessary in order to use such a system, have been under continuous study by the government. Insistence by the public has resulted in the abolition of some grade crossings and the erection of barriers at others.

The increase in rolling stock has been appreciable during the year. The companies have actually acquired locomotives, passenger, freight and plantation work cars. Most of this business, however, has gone to other than American firms.

Passenger and freight services have been greatly improved and all the difficulties resulting from the scarcity of fuel and from the absence of replacement parts for the rolling stock have been removed. These improvements are more noticeable in the recent schedules of narrow-gauge roads on which, besides the considerable increase in the number of trains, combined services have been introduced contributing to facilitating traffic.

Labor relations between the railway companies and their personnel took a satisfactory course during the year.



Quebracho Tie Yard, Santa Fé Railway, Argentina

The classification of the locomotive personnel has been agreed upon between the companies and "La Fraternidad", (an organization of the railway locomotive personnel). The change was effected between the parties themselves without outside intervention. Revision of the classification of the traffic personnel in the following special lines has been begun: subordinates and assistants, comptrollers, telegraphers, signalmen, overseers, train guards and line-men. An election is to be held at all the railway stations for delegates that are to represent the personnel in each special line. The railway personnel requested governmental intervention for the purpose of securing a wage increase. In this respect the government inaugurated an investigation in all the principal centers of the country where there are large numbers of railway people living, to ascertain the increase in cost of living between the years 1920 and 1925. The only incident of importance that occurred during the past year was the strike declared on January 13, 1925, on the Entre Rios and the Argentine Northeastern. Cancellation of the classifications and increases in wages, etc., were demanded with the request that the matter be settled without government intervention. Subsequently the union organizations on strike decided to go back to work.

Chilean Railways Have a Fair Year

During 1925, Chile had approximately 9,480 kilometers of track in operation of which amount 5,840 kilometers are owned by the state and 3,640 by private companies. The balance sheet for the State Railways as of December 31, 1924, showed a profit of 5,352,898 paper pesos, less than half the profits of 1923. The principal item which of interest to American railway equipment and supply manufacturers in Chile is a bill recently passed by the Chilean government authorizing the state railways to contract two current accounts with either a foreign or domestic banking institution, the first up to 25,000,000 paper pesos and the other up to 10,000,000 paper pesos as follows:

"Article No. 1. The State Railways are authorized to contract with any domestic or foreign banks, a loan on current account up to 25,000,000 paper pesos, to enable them to form a working fund to regulate the payments which they have to meet.

"Article No. 2. The same institution is likewise authorized to contract a special loan, of the same type as above, for a maximum of 10,000,000 paper pesos, for the purpose of executing new work and particularly the transformation of stations and the reinforcement of the railways' bridges. The State Railways will cover the service on both loans from their own resources and they are empowered to determine any other contract conditions which these operations may originate."

Progress Shown in Bolivia

The completion of construction on the Atocha Villazon Railway was the outstanding feature in the last fiscal year of the Bolivian railways. During this year Bolivia had approximately 1,076 miles of railroad in operation and outstanding concessions for the construction of twice as much more. The lines in operation comprise the following:

Arica-La Paz Railway, 125 miles in Chile and 151 miles in Bolivia.
Antofagasta & Bolivia Railway (Ltd.), 575 miles in Bolivia and 275 miles in Chile.
Atocha-Villazon Railway, 127 miles.
Empresa Luz y Fuerza Electrica de Cochabamba, 49 miles.
Quaqui-La Paz Railway, 60 miles.
Huanchaca de Bolivia Railway, 26½ miles.
La Paz-Yungas Railway, 16½ miles additional line under construction.
Machacamarca-Unica Railway, 37 miles.
Potosi-Sucre Railway, 34 miles; additional line under construction.
Bolivia Railway Co. (Ltd.) 416 miles.

The railroads on which construction is proposed in the near future, are the Cochabamba-El Beni, Cochabamba-Santa Cruz, Guayaremerin-Riberalta, Iquique-Oruro, Santa Cruz-Yacuiba, and Santa Cruz-Paraguay River projects. The chief financial event of importance was the loan of £600,000 advanced by Simon Patino, the Bolivian "tin-plate king," for the completion of construction on the Potosi-Sucre Railway.

Nationalization in Ecuador

The nationalization of the Guayaquil & Quito Railway gives the government the control of the largest and best organized railroad in Ecuador. Early in 1925 the railroad experienced considerable damage due to heavy rains and in order to pay for the repairs, the company requested authority for a 25 per cent increase in the tariffs. This demand was refused. After much discussion, the government on April 24, 1925, purchased the shares of the road held by the Inca Company, which gave it control of the entire system of 278½ miles. The country during the last fiscal year had approximately 470 miles of road in operation and planned to construct approximately 1,000 additional miles. The government is suffering from the lack of a definite railway policy, which if overcome, should vastly improve the finances of the country. Various contracts were awarded for the construction of sections of the proposed railways. The construction of the Sibambe

Cuenca Railway, was awarded to the Compania Constructora del Azuay of Cuenca, Ecuador. This company is financed by bankers and capitalists of Cuenca and Guayaquil. The entire construction, inclusive of rolling stock, telephone and telegraph lines, is estimated will cost 2,000,000 sucres. Construction work on the Quito-Esmeraldas Railway was to start four months from June 14, 1925. Work was to be carried on under the Dobbie-Simmons contract for the construction of the Quito-Ibarra section of this road. The Ferrocarril a la Costa, a line from Guayaquil to the seaside resort of Salinas, was under construction during the entire fiscal year.

Venezuela, Uruguay and Peru

During the past year practically no change was noted in the Venezuela railway situation. The merger of the Puerto Cabello and the Valencia Railways was effected. Venezuela railway construction is typical of the other Latin American countries, as may be seen from the fact that out of 5,000 miles contracted for, scarcely 1,000 miles have been constructed. The railways that are now operating have, with some few exceptions, all shown profits during the last few years.

All the main roads in Uruguay have enjoyed a prosperous year. No new construction projects were contemplated.

During the last fiscal year it seems as though the various railways of Peru met with one disaster after another. Land slides due to heavy rains caused suspension of traffic on the Central and Paita-Piura railways. For several weeks communication on the main line between Arequipo and Cusco was completely broken down. Transportation between Cerro de Pasco and the mountains was practically

pany. At the present time this traffic moves across Lake Titicaca from Guaqui, the terminus of the Guaqui La Paz Railway, to Puno, the Lake terminus of the system in Peru. The connecting link is a steamship line owned and operated by the Peruvian Corporation.

During the last fiscal year Peru had 1912 miles of railroad in operation, of which 74 were electric. Some few purchases of motive power and rolling stock were made, but few of these were placed in the United States.

The Dunsmuir and Huallaga concessions, which have been considered from time to time in connection with the reorganization of the Peruvian railway system, have evidently fallen through. At one time during the last year there was a rumor that the Dunsmuir concession was to be taken over by a group of tobacco interests but nothing has been heard since. In August, 1925, a bill was introduced in the Peruvian Congress authorizing the construction of a railroad from Cerro Azul to Huancayo, but no action was taken.

Conditions in Brazil Not So Satisfactory

During the last year Brazil had 30,309 kilometers (18,821 miles) of line in operation, or 384 kilometers more than it had in operation during 1923. Of this amount 7,310 kilometers were owned and operated by various state governments; 17,705 kilometers were owned by the federal government which operated 8,562 kilometers and rented 9,143 kilometers to state governments, or to private enterprise. The remaining 5,294 kilometers were privately owned by concession from the federal government.

Of 26 principal railways and railway systems, 14 showed a loss of from 100 contos to 17,000 contos as in the case of



Electric Express Passenger Locomotive, Chilean State Railways

stopped. The Peruvian Corporation, Ltd., was hardest hit by these damages. It, however, immediately commenced rebuilding and was successful in completely repairing the damages by July of this year.

The project long outstanding for the completion of the railway around Lake Titicaca, connecting Puno with Guaqui by the Southern Railway of Peru, has been that a contract be let for the construction of the Bolivian section. It is understood that this procedure will be followed in Peru. If this road is built, it will mean the insertion of a line between the railways of the Peruvian Corporation, Ltd., in Peru and Bolivia, which is not owned by that com-

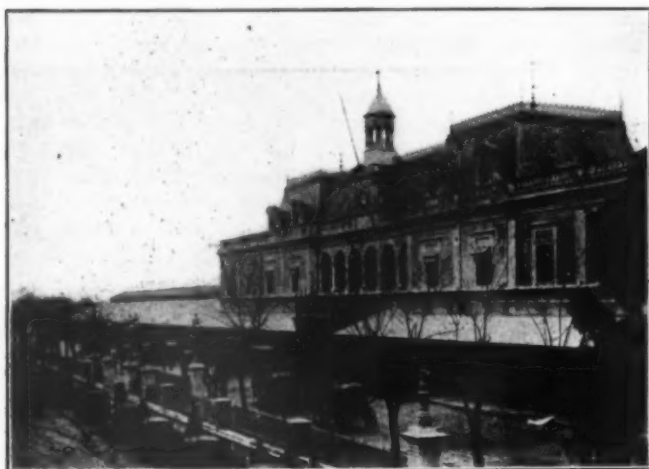
the Brazil Central. The São Paulo Railway showed the largest profit of 32,600 contos.

A greater extension of the country's railways in 1924 was not permitted by the government's policy of retrenchment, which also prevented the acquisition of rolling stock in quantities sufficient to enable the railways to cope with their increased traffic. The military revolt which occurred in São Paulo in July was responsible for heavy losses to some of the roads, principally the Estrada de Ferro Noroeste do Brazil, the Estrada de Ferro Central do Brazil, and the Estrada de Ferro Sorocabana.

In spite of the government's financial difficulties, efforts

were made to continue the construction of certain lines considered of vital economical and political importance, such as the "Longitudinal Line," destined to establish rail communication between Rio de Janeiro and Bahia. In furtherance of this project, 74 kilometers of line were constructed during 1925, of which 46 were on the Central of Brazil, and 28 on the Central da Bahia. There were, at the close of the year, 1,522 kilometers of line in traffic between Rio de Janeiro and Bahia, and 788 Kilometers required to complete the line. Work was in progress on part of the 788 kilometers.

The junction of the Rede Bahiana, which is being extended through the State of Sergipe, with the line connecting Alagoas, Pernambuco, Parahyba and Rio Grande do Norte, is complete, except for a stretch of about 200 kilometers, between Collegio and Cajueiro. The completion of this line, and of the lines now under construction that will connect Parahyba with Ceara and the latter with the capital of Piahy (Therezina), will result in the link-



Station at Santa Fé, Argentina

ing, by rail, of the capitals of 15 states, including the capital of the republic.

Railway supply houses were invited by the federal government to propose financial combinations which would permit the purchase of needed material, payments to be made over a long period. Using the authorization granted by the budget law of January 7, 1924, the government opened the necessary credits, and entered into negotiations, which resulted in the Central of Brazil Railway acquiring 10 locomotives and 310 cars, and the repair of 322 cars, the total value of these contracts amounting to more than 11,500 contos. The Estrada de Ferro Noroeste do Brazil acquired 166 cars, valued at 3,107 contos, and the Estrada de Ferro Ceste de Minas 150 cars, valued at £63,680, or 2,547 contos.

The main line of the Estrada de Ferro Central do Brazil was equipped by the government with the American system of train-dispatching.

For the entire year of 1924 and up until now, the port of Santos, Brazil, due to heavy incoming goods of all kinds, has been congested. The one railroad, English owned, operating between Santos and São Paulo, has been unable to handle the enormous traffic. Then too, the port facilities have been inadequate for the receiving of the goods for unloading from ships. Consequently, during the month of July, an average of 1,000 vessels of all size has been held up from 30 to 90 days unloading cargoes.

During 1924 also, the Sorocabana Railway, running out of São Paulo, was confiscated by the rebels in the revolt

which broke out there in July, 1924, and for over six weeks the traffic to inland points was disturbed. This revolt has not entirely ended as yet, the rebellious troops and citizens now operating to a small extent in the State of Matto Grosso.

Studies are still being made for the electrification of the Central Railway of Brazil. It is doubtful, however, that this work will be carried out—even in part—until some years have elapsed, due to the ruinous financial condition of Brazil.

Colombia Shows Increased Mileage

Due to the American indemnity fund, Colombian railways have been increased from 951 miles in 1924 to 1,109 miles in 1925. The total mileage constructed during the past year was not on any one road, but on various projects extending throughout the country. Now that the indemnity fund has practically all been expended, it is questionable what the government will do toward the completion of the various projects already started. In several instances state loans have been floated for this purpose, but all the projects cannot be finished in like manner. Both private and government owned railways have spent considerable money during the last year in repairing their lines and purchasing new equipment. The country has proved an excellent market for American manufacturers of rolling stock and locomotives. The litigation between the Ferrocarril Norte and the Colombian government as to whether its property should be taken over, was settled against the company by the courts, although an appeal has been noted. It seems to be the policy of the Colombian government that the railroads of the country must be owned and operated by the country.

Among the most important projects to be considered during the coming year is the construction of a railroad from Baranquilla to Cartagena. The only means of communication between these two cities is by water from Puerto Colombia to Cartagena, or else by rail via Calamar. The inauguration of a direct route would greatly expedite fast delivery.

The operating revenues of the principal railroads have shown a slight increase and Colombia has been through one of its best railroad years. Some of the contracts signed are: the extension of the Ferrocarril de Antioquia, which will connect Cauca with the Caldas Railway; construction of a railroad from Bogota to Puerto Wilches; for additional construction on the Pacific and the Nordeste Railways. It is expected that these contracts will prove a source of sale for manufacturers of both rails and materials during this year.

Paraguayan Situation Not Changed

No new railway development has been noted in Paraguay during the last fiscal year. In the period approximately 517 miles of steam railways and 17 miles of electric railways were operated. The principal item of importance was the attempt made by shippers to have the government fix the rates on the Central Paraguay Railway, which is the largest and most important road in the country. The tariffs of the road at present are exceedingly high, according to the shippers, but the government states that intervention is impossible unless the company's dividends exceed 6 per cent of its capitalization. The company has not attempted to fix its capitalization since the losses incurred during the last revolution (1911 and 1912) so that the government has no way of determining whether the company has a legitimate cause for the increase in rates it has effected. Recently the government, on depositing funds in the Bank of England, made a settlement with the railway to indemnify it for the losses incurred during the last revolution.



Eveleigh Locomotive Shops, N. S. W. Railways

General Improvement in Australasia

Railways of Australia and New Zealand improve their methods and equipment and show better results

By W. H. Newman

THE year 1925 in the Commonwealth of Australia and the Dominion of New Zealand was one of generally improving conditions. The net receipts of the railways in both countries were the largest in their histories, and while business conditions throughout the year improved, thus bringing greater traffic, the operating expenses generally showed a decrease. The year just closed must be regarded as a very satisfactory one and the prospects for the ensuing 12 months are, if anything, even brighter.

With the exception of a few short lines constructed for

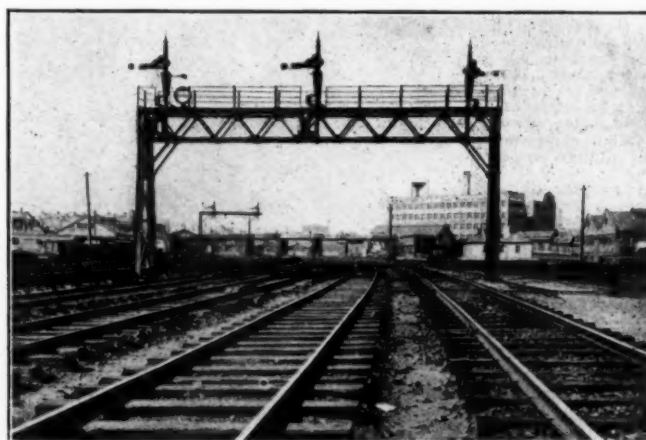
traffic of approximately 27,000 miles; 5,500 miles are of 5 ft. 3 in. gage, 6,500 miles of 4 ft. 8½ in. gage, 14,500 miles of 3 ft. 6 in. gage and 200 miles of 2 ft. 6 in. and smaller gage.

Very severe handicaps in the way of interstate traffic arise owing to this lack of uniformity in gage. The



Dining Room on a Trans-Australian Express

the convenience of timber, coal and other minerals, the whole of the railways of Australia are owned either by the Commonwealth or by individual states. The state-owned railways have a total mileage of line open for



Typical Installation of Automatic Signals

trouble and difficulties due to the necessity of transferring through passengers and freight at places where there are breaks of gage are becoming more serious each year as the volume of business increases. Unification is, therefore, a matter that has occupied a great deal of attention. The adoption of the 4 ft. 8½ in. gage as standard throughout the Commonwealth has been decided upon, but the estimated cost of converting the lines on the mainland to standard gage is £57,200,000, and the work has been deferred for the present.

The railways of New Zealand are also state-owned

and operated. The mileage of line at present in traffic is 3,085 miles.

New Lines Opened for Traffic

During the year 74 miles of 3 ft. 6 in. gage were opened in Queensland, the total mileage of line in operation in that state now being 6,114 miles. New South Wales has now open for traffic a total of 5,656 miles, all of 4 ft. 8½ in. gage; 133 miles were opened in 1925. Practically all of the railways of Victoria are of 5 ft. 3 in. gage and 50 miles were opened in 1925, making the total mileage open for traffic to date 4,484 miles. Both 5 ft. 3 in. and 3 ft. 6 in. gage lines are operated in South Australia. There are 1,190 miles of the former and 1,261 miles of the latter, making a total of 2,451 miles of line in operation. Western Australia has 3,733 miles of 3 ft. 6 in. railway, 104 of which were opened during 1925.

Transcontinental Railway

The Commonwealth government operates the Transcontinental line which runs between Calgoorlie in Western Australia and Port Augusta in South Australia, a distance of 1,052 miles; the whole of this line is standard gage. In all of its length of 1,052 miles this line does not cross a single permanent stream of water. In crossing the Nullarbor Plain the railway runs without a curve for 300 miles. This is probably the world's record for unbroken tangent.

Automatic Signaling

During the year considerable progress has been made on the various railways of the Commonwealth in the

installation of automatic signaling. The most important work carried out in 1925 has been on the New South Wales Railways between Molong and Dubbo, a distance of about 80 miles. This is the first installation of automatic single track signaling to be introduced. The



Machine Bay, Eveleigh Shops, N. S. W. Railways

signals have been installed so as to afford greater security against opposing movements between sidings, while permitting following movements. Considerable departure has been made from the practice adopted elsewhere.

OPERATING STATISTICS—YEAR ENDED JUNE 30, 1925

	New South Wales	Victoria	Queensland	South Australia	Western Australia	New Zealand
Area—Square miles	310,372	87,884	670,500	380,070	975,920	103,861
Population	2,273,584	1,670,521	855,214	544,000	368,027	1,379,487
Miles of railway open	5,656	4,484	6,114	2,452	3,733	3,085
Average miles of railway worked	5,571	4,448	6,078	2,452	3,669	3,067
Total capital cost	£99,623,216	£67,739,091	£51,911,969	£24,046,644	£20,318,120	£44,526,446
Capital cost per mile open	£17,615	£15,107	£8,490	£9,808	£5,443	£14,433
Population per mile open	402	373	140	154	88	447
FINANCIAL RESULTS						
Total earnings	£16,769,452	£12,759,197	£7,109,210	£4,012,736	£3,359,501	£7,102,428
Total working expenses	£11,939,686	£9,429,728	£5,425,167	£2,935,758	£2,347,509	£5,533,136
Net earnings	£4,829,766	£3,329,469	£1,684,043	£1,076,981	£1,011,992	£1,569,292
Percentage return on capital	5.01	4.94	3.24	4.90	4.98	3.57
Operating ratio	71.20	73.91	76.31	73.16	69.88	77.90
Earnings per average mile open	£3,010	£2,869	£1,170	£1,637	£916	£2,316
Working expenses per average mile open	£2,143	£2,120	£893	£1,197	£640	£1,804
Net earnings per average mile open	£867	£749	£277	£440	£276	£512
Earnings per train mile	s. d. 14 4.70	s. d. 14 7.16	s. d. 11 8.92	s. d. 12 0.7	s. d. 13 10.54	s. d. 15 7.65
Working expenses per train mile	10 2.96	10 9.46	8 11.54	8 9.9	9 8.37	12 2.19
Net earnings per train mile	4 1.74	3 9.70	2 9.38	3 2.8	4 2.17	3 5.46
Average number of employees	32,041	24,322	15,516	7,845	7,107	(a)
Average rate of pay	£245	£248	£271	£247	£236	(a)
PASSENGER TRAFFIC						
Number of passengers carried	128,532,038	166,444,142	29,657,832	25,647,487	17,196,672	26,074,811
Number of passengers carried one mile	1,637,380,535	1,426,411,388	(a)	302,184,538	(a)	(a)
Passenger earnings	£6,186,368	£5,380,887	£2,023,950	£1,114,558	£817,745	£2,284,198
Passenger earnings per average mile worked	£1,114	£1,210	£333	£454	£223	£745
Average mileage per passenger journey	12.74	8.57	(a)	11.78	(a)	(a)
Average earnings per passenger	11.55d.	7.76d.	16.38d.	10.43d.	11.41d.	21.02d.
Total passenger train receipts	£6,942,093	£5,981,437	£2,482,026	£1,317,102	£971,323	£2,700,421
Passenger train receipts per average mile worked	£1,246.10	£1,344.74	£408.38	£537.21	£264.75	£880.47
Receipts per train mile	132.07d.	123.73d.	138.69d.	91.35d.	121.44d.	190.64d.
TRAIN MILEAGE						
Passenger train mileage	12,089,308	10,454,251	3,140,163	3,260,629	1,520,631	2,136,620
Mixed train mileage	1,579,572	2,295,898	3,452,265	599,498	1,196,730	3,788,755
Freight train mileage	9,636,036	4,731,857	5,503,313	2,790,541	2,124,112	3,158,248
Total train mileage	23,304,916	17,482,006	12,107,995	6,653,248	4,841,473	9,083,623
FREIGHT TRAFFIC						
Tonnage* of freight hauled (paying)	16,208,476	8,959,556	5,083,658	3,611,313	3,284,915	7,025,316
Tonnage of freight hauled one mile	1,721,046,562	847,202,083	(a)	393,649,467	294,542,418	431,224,596
Net ton miles per mile of line (paying and free)	352.382	228,806	103,211	175,987	94,070	(a)
Average car load—tons (2240 lb.)	10.00	8.9	6.56	7.25	7.21	(a)
Average length of haul (miles)	107.39	94.56	(a)	109.00	89.67	61.28
Average net train load (tons)	177	163	(a)	135	111	(a)
Average gross train load (tons)	388	360	(a)	294	255	(a)
Freight earnings	£9,010,929	£5,775,522	£4,459,262	£2,607,628	£2,198,322	£4,117,746
Average freight and earnings per mile worked	£1,617	£1,298	£734	£1,064	£599	£1,343
Average freight earnings per ton mile (net)	1.29d.	1.64d.	(a)	1.59d.	1.90d.	2.29d.
Average freight earnings per freight train mile	16:10.32d.	19:7.74d.	11:4.98d.	16:4.01d.	15:0.56d.	14:5.86d.
ROLLING STOCK						
Number of locomotives—Steam	1,423	711	714	479	404	656
Number of locomotives—Electric	2	2	1	1	1	6
Passenger train cars (includes rail motors)	2,220	2,725	1,186	715	482	1,893
Freight train cars	22,141	19,250	15,104	9,767	9,745	25,315
Work cars	1,617	752	1,450	552	475	1,006

(a) Figures not available.

* Tons shown are long tons—2,240 lb.

inasmuch as the general standard of signaling and interlocking applied on the double track sections of the state's railways has been maintained. Five of the stations on the line are equipped with passing sidings, "crossing places," and, in addition, there are five blind sidings, "unattended crossing loops," situated between the stations. At the stations, the main line interlocking signals can be rendered automatic at will and attendance for signaling is therefore unnecessary except when trains have to pass or there is switching to be done. There is only one station upon the line at which attendance for signaling is required continuously, and it is thus possible to run trains from end to end of the line without attendance for signaling purposes at any other point. Another new feature, so far as the New South Wales Railways are concerned, is the employment of a track controller, or train dispatcher, stationed at the station midway on the line. By means of a selective telephone system he is kept in touch with every station and signal cabin on the line, and all train movements are controlled by him subject to the signal indications. The "train control" system has been introduced on other sections of the New South Wales Railways and on the other Australian railways.

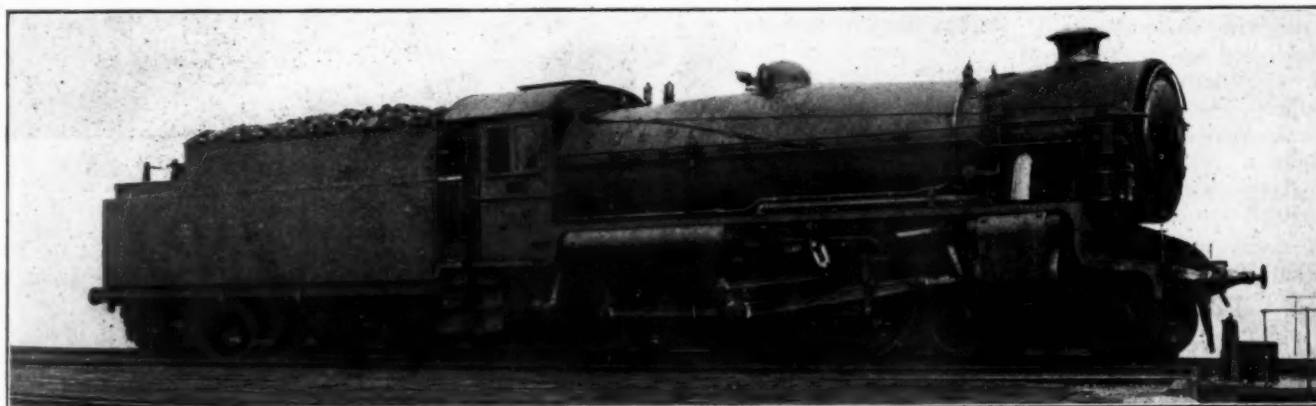
Underground City Railway for Sydney

Quite the largest work at present in course of construction in the Commonwealth is the underground railway to serve the city of Sydney, the capital of New South Wales. Sydney with its immediate suburbs has a population of well over one million. To improve the traffic facilities the existing suburban railways are now being electrified and extended into and around the city in a subway, forming a city loop from which railways will lead to the eastern and western suburbs, at present served by a street railway service system. The total estimated cost of this work is approximately £16,000,000. Jointly with the construction of the city railway is the construction of a bridge spanning Sydney harbor in one

The suburban traffic of the city of Melbourne, capital of the state of Victoria and temporary seat of the Commonwealth government, is operated by electricity. This service was originally a steam operated one but was converted to electric traction in 1923. The experience of the past year has demonstrated the vast improvement affected by the conversion of this suburban railway system from steam to electric traction. A fast and frequent electric train service is provided not only during the rush hours but during the slack part of the day and this service has encouraged considerable additional traffic. The remarkable flexibility of the electrical service enables the length of suburban trains to be increased or decreased in accordance with requirements and car mileage is kept down to the lowest possible figure.

The Labor Situation

The remuneration of railway employees in Australia is fixed by awards of Industrial Arbitration Courts in the various states. The industrial unions make their claims to the court which is usually presided over by a judge, who may elect to sit with one or more assessors from each side. The rates of remuneration to employees are usually fixed with regard to the work performed. The factors considered in determining wage rates are the skill required for the work, the conditions under which it is performed and the regularity of the work. The findings of the court are incorporated in an award, which is effective generally for a duration of two or three years. From time to time boards of trade in each of the various states, after public enquiry as to the increase or decrease in the cost of living, declare what shall be the basic wage to be paid to adult male and to adult female employees. Following on such declaration in regard to the basic wage, the unions, if an increase has been granted, or the employers, if a decrease has been declared, make application to the Arbitration Court for a variation of the award. The industrial court, as a general rule, when dealing



An Australian Express Passenger Locomotive

Standard gage; Cylinders, 23 in. by 26 in.; Driving wheels, 69 in. diameter; Working pressure, 180 lb.; Tractive effort, 30,500 lb.; Tender capacity, 14 long tons, 6,000 imp. gal.

clear span 1,600 ft. long and accommodating railway, vehicular and pedestrian traffic. The cost of this bridge will be approximately £6,000,000.

Electrification Increases Business

When the project is completed the suburban steam railways will be electrified and passengers brought into the city and distributed over four underground and two open air stations on the city loop. These stations will be approximately 3,300 ft. apart and separate entrances and exits are provided so that the incoming and outgoing passengers will never meet.

with such applications for variation of awards by reason of changes in the cost of living, adds to or reduces the wages and salaries of all employees by an amount equal to that which the cost of living has increased or decreased, that is to say, the rate of wages and salaries of all employees covered by awards is increased or reduced by an amount corresponding with the rise or fall in the cost of living.

Highway Competition

In common with other parts of the world the Australian and New Zealand railways are experiencing motor

competition for passenger and freight traffic. All of these government-owned railways have suffered a loss of traffic and the importance of this competition cannot be overlooked. Motor transport offers certain advantages and must be regarded as a permanent feature to be taken into account in the administration of the railways. At the present time the railways are working under a disadvantage in this connection. Motors utilize highways constructed and maintained by, and at the expense of, the taxpayers, but, generally speaking, they carry only those classes of goods which, on account of their value are subject to the highest rates of freight under the railway schedules. Freight of this class, upon which the railways rely to cover the low freight rates on less valuable commodities, is diverted from the railways, while the lower and less payable traffic is retained.

All the Australasian railway systems are looking forward to the time when motor traffic will be called upon to bear a more nearly proportionate cost of the upkeep of the highways, and competition be carried on on more equitable terms. Until then, every effort is being made to prevent traffic being diverted.

In South Australia it was decided, during the year, to cater for passengers who prefer road to rail travel. Road motor coaches of the latest design were purchased and commenced running on February last between Adelaide and Victor Harbor. Today there is practically no other motor service catering for public patronage on that route. It is intended, at an early date, to inaugurate road motor service between other points in this state. Consideration is also being given by the New South Wales Railway Administration to the running of road motor services in and around the city of Sydney.

Rail Motor Cars

The problem of providing a satisfactory and economical train service on the many branch lines tapping the sparsely settled areas throughout the country districts of the various states of the Commonwealth and New Zealand is receiving close attention. Rail motor cars are now well established as the most satisfactory means of providing an expeditious service on lines with a comparatively light traffic. Twenty of such cars are in operation in New South Wales, 17 in Victoria, 13 in South Australia; while a number are also in operation in Western Australia, Tasmania and New Zealand. While the other Australasian states have adopted internal combustion engines for driving rail motor cars, the Queensland Railways are using steam-driven cars with coke as fuel.

Educational Visit of Officers Abroad

The policy of sending suitable officers abroad to study railway methods in other countries is being followed by practically the whole of the railways of Australia and New Zealand. The Victorian Railways have adopted the practice of also granting leave of absence, without pay, to younger employees desirous of gaining personal experience on the railways of other countries.

Public Relations

Increasing attention is being paid each year to the importance attached to an enlightened and well informed public opinion, and the necessity for the collation and dissemination of railway information along scientific lines. In New South Wales and Victoria especially, a sincere effort has been made to create an intelligent public appreciation of railway problems. The general public has been given, through the medium of the press and by personal contact with the administration officers of the railways, a clear insight into railway operations, and the difficulties under which the railways work. This policy has been

of great advantage, not only to the public generally, but to the management.

New South Wales has a highly developed information and publicity bureau, efforts being concentrated on keeping the public informed, mainly through the press, as to the steps that are being taken by the railways to carry out their duties to a public utility. Victoria is working along somewhat similar lines, but in addition to the press, motion pictures are utilized to inform the public of its railway service. A film entitled "The Victorian Railways System at Work" has been screened practically throughout the state as well as before a number of educational institutions and railway organizations in Canada and America.

The desirability of bringing representative city and country business men into closer personal touch with each other, as a means of promoting greater knowledge of the state's finances, resources and industry, has led to the running in Victoria of what is known as "The National Resources Developmental Train." This train comprises dining, sleeping and parlor cars and periodically carries business representatives over the various sections of the lines. Victoria has also inaugurated a "Better Farming Train." The principal object of this train is



Interior of an Australian Passenger Coach

to afford facilities to the primary producers to acquire, by a convenient means, knowledge of the most modern and scientific methods of production. In other parts of the world demonstration trains have been run for the purpose of carrying to the farmer instruction in up-to-date methods, but it is believed that the Victorian Railways "Better Farming Train" is the most complete train of this character in the world. During the year five trips were run, extending over a total period of 49 days. Demonstrations and lectures were given at 52 country centres, at which approximately 50,000 people attended. The lectures and demonstrations of up-to-date farming methods of experts must ultimately result in the railways, as well as the state, benefiting by the increased traffic that can be expected from improved methods of farming.

In New South Wales an "Australian Made Preference Train" is running. This train has been specially fitted up to demonstrate throughout the state what the Australian manufacturer is capable of doing.

Publicity is also being given, particularly in Victoria, to the desirability of stimulating and increasing the local consumption of dried and other fruits, the propaganda being principally conducted by means of special pamphlets and pictorial posters.



Wadi Bunder Viaduct, Bombay, With Electric Train

Indian Railways Going Forward

*1924-25 a bumper year—First separate railway budget—
More railways coming under state management*

By Railway Age's Correspondent in India

THE fiscal year ending March 31, 1925, was a bumper year for the Indian railways. Gross earnings increased by about \$23,000,000 to \$318,000,000, while net earnings increased by about \$20,000,000 with the result that the operating ratio decreased from 63.50 per cent to 60.45 per cent and the return on the capital invested increased from 5.48 per cent to 6.19 per cent. Traffic, however, during the latter months of 1925 has fallen off considerably—especially coal, wheat and passengers—and the gross earnings for the six months ending September 30, 1925, for the state-owned railways—which comprise 27,325 miles out of a total mileage of 38,278—are about \$4,000,000 less than for the similar period of the previous year. The excellent results shown in 1924-25 were due both to the provision of increased facilities and to increased efficiency of operation, as well to improved traffic and most railways showed greatly improved operating results during the year.

In last year's report reference was made to the reorganization of the Railway Board, which corresponds to the Interstate Commerce Commission in America, but is an actual managing board as well. This new organization has enabled a definite policy of rehabilitation and of new construction to be worked out and during 1924-25 about 233 miles of new lines were opened, while at the end of March, 1925, 1,201 miles were under construction and 1,084 miles had been sanctioned, but construction had not commenced. Most of the new construction is in South India, Burma and the coal fields area in Central India where there is the most urgent demand for improved facilities.

One interesting line opened for traffic on November 2, 1925, was the Khyber Railway which runs from Jamrud, a few miles from Peshawar on the Indian side of the

Khyber Pass, where the railway stops short, to the Afghan border. The Khyber Pass has been the main trade route to India from the north from the earliest days and most of the trade with far distant Central Asia still follows this route in picturesque caravans.

After considering the merits of a line built to a 2 ft. gage, meter gage with rack and the 5 ft. 6 in. gage adhesion line, it was finally decided to adopt the 5 ft. 6 in. gage line. The advantages of this gage are that:

- (1), a break of gage is avoided;
- (2), rolling stock can be pooled instead of being tied to the line;
- (3), the line will have greater carrying capacity.

Although this line is only a short one—27.74 miles—yet the work entailed has been heavy. Starting at a height of about 1,500 ft. it rises to about 3,500 ft. at Landi Kotal and then descends to a height of about 2,400 ft. at Landi Khana. The ruling grade for up trains to Landi Kotal is 3 per cent compensated for curvature, while that for down trains from Landi Khana is 4 per cent, also compensated. There are in all 10 stations, excluding Jamrud, and of these three are reversing stations necessitated by the development of distance for reduction of gradient.

Considerable difficulties were met with during the construction, the hill sides being treacherous in places, while on July 29 of this year a very heavy storm burst over the whole of Khyber area and the rain gage at Landi Kotal registered $3\frac{1}{2}$ in. of rain in about two hours. The railway stood this test extraordinarily well.

Col. G. R. Hearn of the Royal Engineers surveyed and planned this railway in 1919 and was in charge of the construction which started towards the end of 1920, to the end of 1922.

In accordance with the wishes of the Legislative As-

sembly, which corresponds to the Congress in America, the working of the East Indian Railway was taken over by the state on January 1, 1925, and that of the Great Indian Peninsula on July 1, 1925. The state in addition to owning 27,325 miles now directly manages 15,414 miles or 44.66 per cent, of the mileage of Class 1 railways.

The first separate railway budget was presented to the Legislative Assembly in February, 1925, and, as the contribution to central revenues is fixed in accordance with the terms of the agreement for the separation of the railway from the general finances of the country, it is possible to present the railway budget before the general budget. The members of the Legislative Assembly showed a great interest in all questions of railway operation and there can be little doubt that the separation of railway finances will be most beneficial not only to railways, but also to the country as a whole.

The state-owned railways have now started their own reserve fund in addition to a depreciation fund for state-managed railways, and they will thus be in a position to work to a regular program of new construction and rehabilitation.

The year 1923 saw the opening, on February 3, by Sir Henry Wilson, governor of Bombay, of the first electric railway in India from Victoria Terminus, Bombay, to Kurla. This is only the first installment of the electrification of all the suburban lines round Bombay, both on the great Indian Peninsula and the Bombay, Baroda & Central India. It is also proposed to introduce electric operation up to Poona, 119 miles from Bombay, and to Igatpuri, 85 miles from Bombay, as the railway on both these sections has steep gradients which naturally limit the loads. Further schemes for the electrification of the lines round Madras are well advanced and the prospects of electrification around Calcutta and in other parts of India are being actively examined.

Reference was made last year to the introduction of a revised organization somewhat similar to that found on American and South African Railways, on the North Western Railway in 1924. During 1925 a similar organization was introduced on the Oudh & Rohilkhand and the East Indian in February, while on July 1, 1925, advantage was taken of the East Indian Railway having come under state management to amalgamate these two lines and to hand over the Delhi-Umbala-Kalka Railway, previously operated by the East Indian Railway to the North Western Railway. Advantage was also taken of the Great Indian Peninsula coming under state management to hand over another section of the East Indian to that line on October 1.

Every year the Indian Railway Conference Association, which corresponds to the American Railway Association, meets in October and this year it is interesting to note that it has decided to start committees based on the lines of the divisions of the American Railway Association. There are at present various committees but these deal only with questions which are referred to them by

any of the railways. The duties of these committees and of the other committees which will be formed will be enlarged so that every year questions of general interest will be investigated. At the meeting this year it was also decided to make the car pool on the 5 ft. 6 in., or broad gage, railways permanent. This car pool has been provisionally in force for some years and it has been found that the advantages outweigh the disadvantages.

Further progress was made during the year with the standardization of locomotives, passenger and freight cars, bridge design, etc., in accordance with the policy of the Railway Board of "progressive standardization as a continuous process." Committees sat for various periods during the year and, as regards locomotives, orders will be placed for some trial engines of the new types before the end of the year.

In September the 5 ft. 6 in. gage Garrett engine for the North Western was shipped from England. This locomotive will be tried against the Baldwin Mallet compound articulated locomotive already in India on the Quetta division of this railway where the ruling grades are 4 per cent. The Garratt is a 2-6-2-2-6-2 type, weighing in working order 178 long tons. Safety valves blow off at 180 lb. pressure, although the boiler has been designed for 200 lb. pressure. The maximum weight per axle is 19½ long tons. The weight of the Mallet is 188 long tons in working order and the boiler has been designed for 210 lb. working pressure.

Trials were carried out during the year with various types of automatic couplers and transition devices and a scheme has been worked out for the provision of shops at certain centres where the work of conversion of the existing freight stock will be carried out. The types that are being tried are the M. C. B. type as found in America and the Willison automatic coupler. The design of suitable gear for use with the automatic coupler during the transition period is probably the most difficult problem.

Considerable progress has been made with the scheme for the training of junior railway officers and of the senior subordinate staff on the Indian railways. On March 2, a transportation school was opened at Chandausi and of the 62 men attending the first course, 22 attended the higher course and 40 the junior course while a special course for probationary officers was commenced. It is intended to have eventually on each railway system a school at which the subordinate staff of all grades employed in train operation will go through periodical courses. Chandausi as the central school will provide courses for junior officers, the more senior subordinate staff and those likely to prove suitable for promotion to officers and will also take charge of the training of probationary officers. In the future it is possible to look forward to the development of the new school into something like a railway staff college where the science and business of railway operation and management will be studied and taught to railway officers and staff.



Baldwin Locomotive in Service in India

General News Department

The St. Louis Railway Club will hold its next meeting on January 8. Donald Conn, manager of public relations of the Car Service division of the A. R. A., will deliver an address.

The Railroad Labor Board has over-ruled the contention of unorganized employees in the telegraph department of the Atlantic Coast Line that elections held by the company to select representatives of the employees to negotiate with the management in wage matters, were not participated in by a majority of the telegraph employees. The case was dismissed.

P.R.R. Mutual Benefit Association

The Mutual Beneficial Association of Pennsylvania Railroad Employees, Incorporated, now has a membership numbering 17,000 employees in 68 local assemblies. Over \$7,000,000 worth of insurance has been written for the employee-members and the investments held by the association total over \$650,000. Since organization in 1914, over \$275,000 in death and permanent disability benefits has been paid to beneficiaries.

The association publishes an enterprising monthly magazine and through its stock buying plans employees have bought 26,357 shares of Pennsylvania Railroad Company stock valued at \$1,394,195.

Employee-members also share varied benefits derived from local buying committees, tailoring arrangements, etc. M. B. A. stores and restaurants sold to employees \$500,000 worth of merchandise during 1925. In many cases the money thus saved by the member enabled him to more than defray the expense of his membership dues in the association, including the premiums charged to carry an insurance certificate. As an example of centralized buying, the home office at Philadelphia, during 1925, disposed of 50,000 lb. of coffee, value \$20,000, and also 44,500 lb. of Christmas candy at a saving of \$13,350 to the members.

M. B. A. was built upon the principle that better and more permanent adjustments come from mutual co-operation and frankness on both sides; men and management harmoniously determining wages and working conditions around the council table by the rule of reason. The president of the association is Millard F. Loughner, 1841 Filbert street, Philadelphia.

Traffic

In a circular letter addressed to chief operating officers the Car Service Division of the American Railway Association says that instances have been called to its attention in which local railway people, evidently through lack of information, have refused to accept shipments consigned to the United States government or its authorized agents, because of embargoes which do not specifically exempt government freight. The circular calls attention to the provisions of the interstate commerce act making it illegal to embargo such shipments and to the embargo rules which state that mention of government freight in exemptions to embargoes is not necessary, it being understood that no embargo will apply to this class of freight.

Interstate Commerce Commission

The commission, in a case decided on December 8 on complaint of the Lumbermen's Exchange, has held that the rates on lumber in carloads from Los Angeles, Wilmington and San Pedro, Calif., to El Paso, Tex., and destinations in Arizona and New Mexico are unreasonable and unduly prejudicial and has prescribed new rates for the future. In another case decided on the same day on a complaint of the Los Angeles Lumber Products Company the commission found the interstate rates on lumber and its products from Oregon and California points to California destinations not unreasonably low or unduly prejudicial to complainant or to San Pedro.

Court News

Contract to Furnish Cars on

Certain Days Unenforceable

The Minnesota Supreme Court holds that a contract by a common carrier in interstate commerce to furnish cars to a shipper on certain days imposes a greater obligation on the carrier than that implied in the published tariffs, and cannot be enforced.—*Richey & Gilbert Co. v. N. Pacific (Minn.)*, 204 N. W. 27.

Delay in Constructing Bridge—Penalty Unwarranted

In an action to recover a penalty for delay in building a bridge over defendant interstate railroad's track, as provided by South Carolina Laws 1922, p. 1543, it appeared that there was no road leading to the bridge and therefore the delay could not have inconvenienced the public. The South Carolina Supreme Court held that it could not have been the legislature's intention to impose the penalty in such circumstances, and so to construe the act would render the penalty an unconstitutional burden on interstate commerce.—*Pickens County v. Southern (S. C.)* 127 S. E. 365.

State's Right to Require Train Connections

The North Dakota Supreme Court holds that under sections 4777 and 4779 N. Dak. Comp. Laws, 1913, the state railroad commissioners may compel train connections of competing lines when they are within one-half mile of any common point, if such connection does not place a burden on interstate commerce. It holds that the Transportation Act, 1920, does not impair or affect the state's right to require just and reasonable freight and passenger service for intrastate business except as to regulations inconsistent with any lawful order of the Interstate Commerce Commission.—*Milhollan v. Great Northern (N. Dak.)*, 204 N. W. 994.

Non-resident Railroad's Car

Not Subject to Garnishment

The Georgia Court of Appeals holds that where a railroad company of that state receives from a railroad company of another state a car under a contract giving the domestic company the use of the car, this right of use is superior to the right of an attaching creditor of the non-resident company who, without any other lien, seeks to attach the car by garnishment on the domestic company; and, in the absence of appropriate equitable pleadings in a court with jurisdiction to render affirmative equitable relief, the car is not subject to garnishment.—*Clark Milling Co. v. St. Louis Southwestern (Ga. App.)* 127 S. E. 783.

Proportionate Damages for Partial Loss of Baggage

A trunk was checked as baggage on two full-fare tickets from Omaha, Neb., to Winnetka, Ill., without declaration of greater value than \$100 for each passenger. The actual value of the whole was \$675. The total value of articles lost or stolen in transit was \$111.30, for which sum the passengers sued the railroad. Had a declaration of value been made, an additional charge would have been made of 10 cents for each increase of \$100. The Nebraska Supreme Court reversed judgment for the plaintiffs, holding that where there is a partial loss of interstate baggage, checked on the lower of two alternative rates based on values, the agreed valuation does not fix an arbitrary limit of recovery, but a ratio, the proportion being the amount which the real value of the lost articles bears to the total value of the baggage checked. In the present instance the ratio was the proportion which \$111.30 bore to \$675. On that basis the plaintiffs were held entitled only to \$32.98.—*Robidoux v. Chicago & N. W. (Neb.)*, 204 N. W. 870.

Accepting Less than Legal Rate for Berth

The federal district court for northern Illinois holds that a violation by a carrier's agent of section 10 of the Interstate Commerce Act by accepting less than the legal rate for passenger transportation does not require collusion between the carrier and the agent. The court says: "It was undoubtedly the purpose of Congress to hold for criminal misconduct, not only the carrier, but any officer, director, agent, or other person acting for or employed by the carrier who might be in control of the facilities for rendering service or the service which the passenger desired to use." The prosecution was of a Pullman Company agent for accepting less than legal rates for sleeping car accommodation.—U. S. v. Estes, 6 Fed. (2d) 902.

Duty of Coal Shipper Claiming

Exemption from Demurrage

The evidence in an action for demurrage on shipments of coal from the defendant's mine showed that the demurrage was based on tariffs issued under the Interstate Commerce Act. A clause in the tariff filed, providing for an exemption of coal cars, subject to car distribution rules, from demurrage charges, is held to be notice to a coal company and the duty is cast upon it to comply with the terms prescribed by the railroad company, if it desires to avail itself of the benefit of such exemption. A failure on the coal company's part to bring itself within such exemption renders it liable to the railroad company for demurrage charges under the tariff.—B. & O. v. Dellslow (W. Va.) 127 S. E. 43.

Competition with Railroad by

Unlicensed Motor Vehicle Enjoined

In a suit by the New Haven to restrain the operation of a passenger motor vehicle by defendant between Boston and Brockton or intermediate points unless he obtained license therefor, it appeared that the railroad has a valid franchise to operate its railroad between these points, while defendant had no license to operate motor vehicles in Boston or Brockton or any intervening municipality. The route of the defendant's motor vehicles paralleled in general the plaintiff's railroad between Boston and Brockton. Defendant's competition caused a substantial loss of passenger revenue to the railroad. The Massachusetts Supreme Judicial Court holds that the railroad is entitled to injunction. Its franchise right carries with it heavy obligations to the public, and although this right "is not exclusive against other grants authorized by the Legislature, it is exclusive against one conducting competition, as is the defendant, without a franchise or license and contrary to law."

The operation of the buses on the highway contrary to the precise prohibition of Massachusetts General Laws, chapter 159, section 45, requiring a license, rendered the vehicles outlaws and constituted a nuisance; and one who suffers private, special and peculiar injury, as distinguished from the public wrong, through the maintenance of a public nuisance, is entitled to injunctive relief.—New York, N. H. & H. v. Deister (Mass.), 148 N. E. 590.

Labor Board Decisions

Trackmen Demand Switchtender's

Pay for Handling Switches

While an interlocking plant on the Baltimore & Ohio at the end of double track at Milan, Ind., was out of commission while undergoing repairs, two trackmen were employed to operate the switches by hand, under the direction of the block operator. The employees contended that as they were handling switches their responsibility was as great as that of a switchtender and that they should be given a switchtender's rate of pay, 55 cents an hour, instead of a trackman's rate of 39½ cents. The carrier contended that the responsibilities were not as great as those of a regular switchtender and that the work was not as arduous, since the throwing of switches for main line trains averaging 37 trains per 24 hours did not compare with the work required of a switchtender in yard operation. Furthermore, the work of the two trackmen was constantly under the supervision of the block operator. The decision of the board denied the claim of the employees.—Decision No. 3976.

Assistant Section Foremen

Entitled to Established Rate

On June 8, 1923, an agreement was entered into between the Chicago & North Western and the Brotherhood of Maintenance of Way Employees establishing a rate of five cents per hour higher than the rate of laborers for assistant section foremen but maintaining existing higher rates. At that time there were two assistant foremen in the yards at Butler, Wis., receiving 49 cents an hour and on July 2 of that year an additional position of assistant section foreman was established at the rate of 45 cents. One of the foremen receiving the higher rate was demoted to laborer and the other died, whereupon the foreman who was paid 45 cents remained as the only assistant section foreman in the yard. It was contended by the brotherhood that he was entitled to the higher rate of 49 cents per hour, but the railroad refused to grant the increase. The decision of the board is that the agreement had specifically provided that existing higher rates of pay would be maintained and as the rate of 49 cents was in force the carrier could not deviate from the agreement so made unless and until mutually agreed upon in conference. As no such conference had been held the board sustained the claim of the employees.—Decision No. 3980.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 163 Broadway, New York City. Next convention, May 4-7, 1926, New Orleans, La. Exhibit by Air Brake Appliance Association.
- AIR BRAKE APPLIANCE ASSOCIATION.—John B. Wright, Westinghouse Air Brake Co., Pittsburgh, Pa. Meeting with Air Brake Association.
- AMERICAN ASSOCIATION OF ENGINEERS.—H. Almert, 63 E. Adams St., Chicago. Next convention, June, 1926, Philadelphia, Pa.
- AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—Grant Williams, 1341 Railway Exchange, Chicago.
- AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 So. Michigan Ave., Chicago. Next meeting, June 1, 1926, Atlantic City, N. J.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. K. R. of N. J., 143 Liberty St., New York.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, June 15-18, 1926, Montreal, Quebec, Canada.
- AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—T. E. Welsh, Chicago, North Shore & Milwaukee, Highwood, Ill. Next convention, 1926, Baltimore, Md.
- AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 292 Madison Ave., New York. Annual convention, October, 1926.
- AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borchardt, 202 North Hamilton Ave., Chicago, Ill.
- AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.
- Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York.
- Freight Station Section (including former activities of American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.
- Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, April 20, 1926, Dallas, Tex.
- Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association).—J. C. Caviston, 30 Vesey St., New York, N. Y. Annual meeting, June 23-24, 1926, Mount Royal Hotel, Montreal, Canada.
- Safety Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, April 13-15, 1926, St. Louis, Mo.
- Telegraph and Telephone Section (including former activities of the Association of Railroad Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York.
- Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill. Next meeting, April, 1926.
- Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.
- Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Annual convention, March 9-11, Chicago. Exhibit by National Railway Appliances Association, March 8-11.
- Construction and Maintenance Section.—E. H. Fritch.
- Electric Section.—E. H. Fritch.
- Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting, March 8-9, 1926, Chicago, Ill.
- Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Annual convention, June 9-16, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association.
- Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Next meeting, September 21-23, 1926.
- Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y. Next meeting, June 9-11, 1926, Atlantic City, N. J.
- Division VII.—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.
- Car Service Division.—C. A. Buch, 17th and H Sts., N. W., Washington, D. C.

- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Exhibit by Bridge and Building Supply Men's Association.
- AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—H. W. Byerly, General Immigration Agent, Northern Pacific, St. Paul, Minn. Annual meeting, June 23-25, 1926, Vancouver, B. C.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Annual convention, March 9-11, Chicago. Exhibit by National Railway Appliances Association.
- AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)
- AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. & St. P. Ry., 11402 Calumet Ave., Chicago. Annual convention September 1-3, 1926, Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.
- AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, 1319-21 F St., N. W., Washington, D. C.
- AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eisenman, 4600 Prospect Ave., Cleveland, Ohio.
- AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, 1315 Spruce St., Philadelphia, Pa. Annual meeting, Atlantic City, June 21-25, 1926.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—29 W. 39th St., New York. Regular meetings 1st and 3rd Wednesday in month, except July and August, 33 W. 39th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division. Marion B. Richardson, Associate Mechanical Editor, *Railway Age*, 30 Church St., New York.
- AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 10 East Huron St., Chicago, Ill. Biennial convention, July 18, 1927.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—E. J. Stocking, 111 West Washington St., Chicago. Next convention, January 26-28, 1926, Cleveland, Ohio.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual meeting, May 18-20, 1926, Los Angeles, Calif.
- ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.
- ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th and H Sts., N. W., Washington, D. C.
- ASSOCIATION OF RAILWAY SUPPLY MEN.—S. A. Witt, Detroit Lubricator Co., Chicago. Meeting with International Railway General Foremen's Association.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Fred M. Condit, Fairbanks, Morse & Co., Chicago. Meeting with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charron St., Montreal, Que.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.
- CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.
- CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—R. E. Giger, 721 North 23rd St., East St. Louis, Ill. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.
- CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.
- CHICAGO CLAIM CONFERENCE. Personal Injury Section.—F. L. Johnson, Chicago & Alton R. R., 340 Harrison St., Chicago. Meets 12:30 p. m., first Monday each month, Sherman Hotel, Chicago.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson, W. H. Miner, Rookery Bldg., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.
- CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.
- CLEVELAND STEAM RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, Hotel Cleveland, Public Square, Cleveland.
- EASTERN RAILROAD ASSOCIATION.—E. N. Beasling, 614 F St., N. W., Washington, D. C. Annual meeting, May 13, 1926, Railroad Club, New York.
- FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Next convention, August 17-19, 1926, Hotel Winton, Cleveland, O. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.
- INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—Edwin T. Jackman, 710 W. Lake St., Chicago.
- INTERNATIONAL RAILWAY CONGRESS.—Office of Permanent Commission of the Association, 74 rue du Progrès, Brussels, Belgium. General secretary, P. Ghilain. Next session of the Congress, Spain, 1926.
- INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. B. Hutchison, 1809 Capitol Ave., Omaha, Neb. Annual convention, May 11-14, 1926, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.
- INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha Ave., Winona, Minn.
- INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—F. P. Roesch, 1942 McCormick Bldg., Chicago, Ill. Meeting with International Railway Fuel Association.
- MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Next meeting, May 25-28, 1926, Hotel Statler, Buffalo.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)
- MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)
- MOBILE TRAFFIC & TRANSPORTATION CLUB.—T. C. Schley, 71 Conti St., Mobile, Ala. Regular dinner meetings, 6 p. m., on 2nd Thursday of each month, Cawthon Vineyard, Mobile, Ala.
- NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—J. S. Penney, T. J. Moss Tie Company, 720 Security Bldg., St. Louis, Mo. Next convention, January 28-29, 1926, Hotel Cleveland, Cleveland, Ohio.
- NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Annual convention, November 9, 1926, Asheville, N. C.
- NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York. Annual convention, April 28-30, 1926, Charleston, S. C.
- NATIONAL HIGHWAY TRAFFIC ASSOCIATION.—Elmer Thompson, 12 East 53rd St., New York.
- NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 825 South Wabash Ave., Chicago. Annual exhibition, March 8-11, Coliseum, Chicago, at convention of American Railway Engineering Association.
- NATIONAL SAFETY COUNCIL.—Steam Railroad Section: E. R. Cott, Safety Agent, Hocking Valley Ry., Columbus, Ohio.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August.
- PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.
- PURCHASER AND STORES DIVISION.—(See American Railway Association, Division VI.)
- RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Next annual convention, June 8-11, 1926, Chateau Frontenac, Quebec, Canada.
- RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa.
- RAILWAY CAR MANUFACTURERS' ASSOCIATION.—W. C. Tabbert, 61 Broadway, New York.
- RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.
- RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)
- RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Annual meeting with Association of Railway Electrical Engineers.
- RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—Joseph Sinkler, Pilot Packing Co., Peoples Gas Bldg., Chicago. Meeting with Traveling Engineers' Association.
- RAILWAY FIRE PROTECTION ASSOCIATION.—K. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Annual meeting, October 12, 1926.
- RAILWAY REAL ESTATE ASSOCIATION.—C. C. Marlor, Room 1243, Transportation Building, Chicago.
- RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)
- RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, A. R. A., June 9-16, Atlantic City, N. J.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I.
- RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 21-23, 1926, Chicago. Exhibit by Track Supply Association.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.
- SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—J. E. Rubley, Southern Railway Shop, Atlanta, Ga. Meets semi-annually.
- SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Cartier, Car Serv. Agent, Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.
- SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—W. R. Mau, Vanadium Alloys Steel Co., Latrobe, Pa.
- TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.
- TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual meeting, September 14-17, 1926, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.
- WESTERN RAILWAY CLUB.—Bruce V. Crandall, 226 West Jackson Boulevard, Room 1001, Chicago. Regular meetings, 3rd Monday each month, except June, July and August.
- WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, 1735 Monadnock Block, Chicago, Ill.

Signaling

THE SOUTHERN PACIFIC has ordered from the General Railway Signal Company, an electric interlocking, 36 working levers, for Summit, Cal.

THE LOS ANGELES & SALT LAKE has ordered from the General Railway Signal Company an electric interlocking, 28 working levers, for Hobart street, Los Angeles.

THE FLORIDA EAST COAST has ordered from the General Railway Signal Company an electric interlocking, 8 working levers, for Bunnell, Fla. Color-light signals will be used.

THE LIMA LOCOMOTIVE WORKS has ordered from the General Railway Signal Company automatic train control apparatus for 25 locomotives to be built for the New York Central Lines.

THE SOUTHERN PACIFIC has ordered from the Union Switch & Signal Company automatic block signals, style "B" semaphores, for 280 miles of line; 48 miles double track, 232 miles single.

THE AMERICAN LOCOMOTIVE COMPANY has ordered from the General Railway Signal Company automatic train control apparatus for 99 locomotives which are to be built for roads in the New York Central system.

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company, 24 color-light signals and other apparatus for Elkhart, Ind.; also switch machines, a table interlocking and other apparatus for Huron, Ohio.

THE DETROIT TERMINAL is to be interlocked with the Detroit Street Railways at Warren avenue, Detroit, Mich., and the Union Switch & Signal Company has received an order for a mechanical interlocking, 16 levers. Color-light signals will be used. The street railway tracks lie in the street and the mechanical pipe lines will be run underground.

Construction

CHICAGO & NORTH WESTERN.—Bids are being received for the construction of a top deck on Dock No. 1 at Ashland, Wis., to cost \$375,000.

SEABOARD AIR LINE.—The Interstate Commerce Commission has extended to February 1 the time within which the Seaboard-All Florida and the Naples, Seaboard & Gulf may begin the construction of their proposed new lines in Florida under the certificate recently issued by the commission.

UNION PACIFIC.—Company forces have begun the construction of an extension from Cottier, Wyo., to a point five miles south of there. Application has been made to the Interstate Commerce Commission for permission to construct a branch line 10 miles long from Yoder, Wyo., southward into the Hawk Springs irrigation district.

Trade Publications

AIR COMPRESSORS.—Duplex single stage and two-stage cross-compound air compressors, Class DB and DE, are described and illustrated in a 16-page bulletin, Form No. 126, which has been issued by the Pennsylvania Pump & Compressor Company, Easton, Pa.

WELDING SUPPLIES.—The Lincoln Electric Company, Cleveland, Ohio, has issued a new catalog dealing with welding supplies, including cables, glass, shields, welding electrodes, aprons, gloves, brushes, and other accessories needed for repair, structural or production jobs.

ENGINEERING ACHIEVEMENTS.—Manuscript No. A-02458, descriptive of its engineering achievements for the year 1925, has been issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. The developments cover equipment for the generation and distribution of power; steam turbines, condensers and stokers; heavy railway traction; radio, and miscellaneous achievements.

STEAM TURBINES.—Steam turbines rated at 500, 600 and 750 kw. are described in Bulletin GEA-235 issued by the General Electric Company, Schenectady, N. Y. The general principles and advantages of steam turbines are discussed, and section and steam path diagrams shown. The type D-54 turbine for the driving of centrifugal pumps, blowers and other classes of mechanical drive, is described in Bulletin GEA-197.

GENERAL ELECTRIC PRODUCTS.—Catalog 6001B, superseding all previous catalogs issued by the company, with the exception of those dealing with railway, mine and industrial supplies and merchandise products, is being distributed by the General Electric Company, Schenectady, N. Y. The book contains more than 1,100 pages and is thumb-indexed into sixteen sections as follows: Generation, wire and cable, distribution transformers, arresters, voltage regulators, switchboards and accessories, meters, instruments, motors, motor applications, industrial heating, miscellaneous and indexes. In the indexes products are classified both by subjects and by catalog numbers.

Railway Officers

Financial, Legal and Accounting

T. J. Norton, assistant general solicitor of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, has resigned.

A. A. Drummond has been appointed assistant auditor of freight receipts of the New York, New Haven & Hartford and the Central New England.

Operating

L. F. Muncey, who has been promoted to superintendent of transportation of the British Columbia district of the Canadian National, with headquarters at Vancouver, B. C., was born on March 15, 1876, at Kensington, Prince Edward Island, Canada, and entered railway service in August, 1891, in the employ of the New Brunswick & Prince Edward Island Railway, now a part of the Canadian National. He was later promoted to agent and operator and in June, 1901, was employed in a similar capacity on the Canadian Northern, which is also now a part of the Canadian National. Mr. Muncey was promoted to traveling auditor in August, 1902, and held that position until May, 1908, when he was promoted to chief traveling auditor. In April, 1909, he was appointed agent at Baudette, Minn., where he remained until December, 1914, when he was appointed general chairman of the Order of Railroad Telegraphers at Winnipeg, Man. Mr. Muncey was appointed assistant superintendent on the Canadian National at Vancouver, B. C., in 1919, and in August of the following year was promoted to superintendent of the Kamloops division, where he remained until his promotion to superintendent of transportation of the British Columbia district.

E. L. McLaurine, who has been promoted to superintendent of the Louisiana division of the Illinois Central, with headquarters at McComb, Miss., was born on March 18, 1882, at Brandon, Miss., and entered railway service in May, 1895, as a messenger boy on the Illinois Central at McComb. He was later employed there as a caller and as a yard clerk, and was promoted to brakeman in September, 1901. Mr. McLaurine was promoted to conductor in July, 1903, and served in that capacity until October, 1918, when he was promoted to trainmaster of the Louisiana division. In August, 1922, he was transferred to the Kentucky division, where he remained until April, 1923, when he served for several months on the examining board and as a member of the rules committee. He was promoted to trainmaster of the Fulton district of the Tennessee division, with headquarters at Fulton, Ky., in November, 1924, where he remained until his recent promotion to superintendent.



E. L. McLaurine

Mechanical

A. B. Ford, general master mechanic of the Central district of the Great Northern, with headquarters at Great Falls, Mont., has been transferred to the Lake and Eastern districts, with headquarters at Duluth, Minn., succeeding T. E. Cannon, who has retired.